Formulas in Gearing

Brown & Sharpe Mfg. Co.

Providence, R. I., U. S. A.

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FORMULAS

IN

GEARING.

FOURTH EDITION.

WITH PRACTICAL SUGGESTIONS.

PROVIDENCE, R. I., U. S. A.

BROWN & SHARPE MANUFACTURING COMPANY.

1905.

PREFACE.

It is the aim, in the following pages, to condense as much as possible the solution of all problems in gearing which in the ordinary practice may be met with, to the exclusion of problems dealing with transmission of power and strength of gearing. The simplest and briefest being the symbolical expression, it has, whenever available, been resorted to. The mathematics employed are of a simple kind, and will present no difficulty to anyone familiar with ordinary Algebra and the elements of Trigonometry.

CONTENTS.

FORMULAS IN GEARING.

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CHAPTER I.

SYSTEMS OF GEARING.

(Figs. 1, 2.)

There are in common use two systems of gearing, viz.: the involute and the epicycloidal.

In the involute system the outlines of the working parts of a tooth are single curves, which may be traced by a point in a flexible, inextensible cord being unwound from a circular disk the circumference of which is called the *base circle*, the disk being concentric with the pitch circle of the gear.

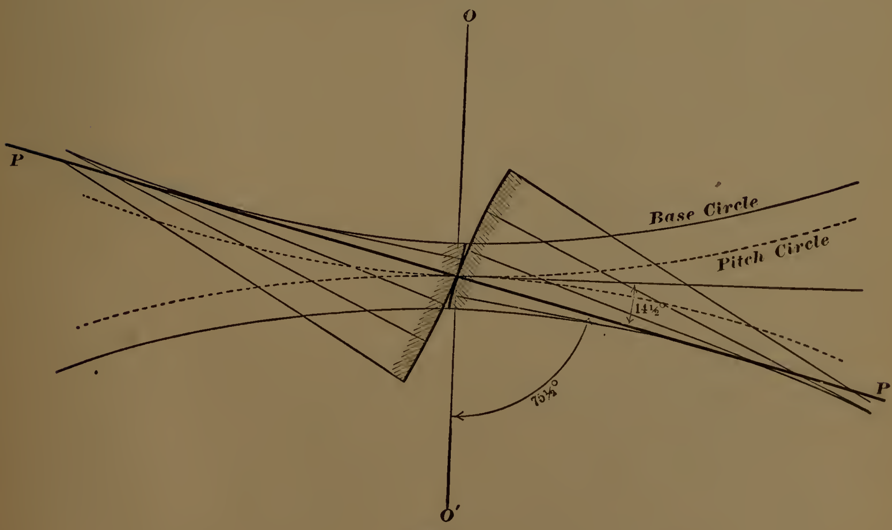


Fig. 1.

In *Fig. 1* the two base circles are represented as tangent to the line P P. This line (P P) is variously called "the line of pressure," "the line of contact," or "the line of action."

In our practice this is drawn so as to make with a normal to the center line (O O′) 14½°, or with the center line 75½°.

The rack of this system has teeth with straight sides, the two sides of a tooth making, together, an angle of 29° (twice 14½°).

This applies to gears having 30 teeth or more. For gears having less than 30 teeth special rules are followed, which are explained in our "Practical Treatise on Gearing."

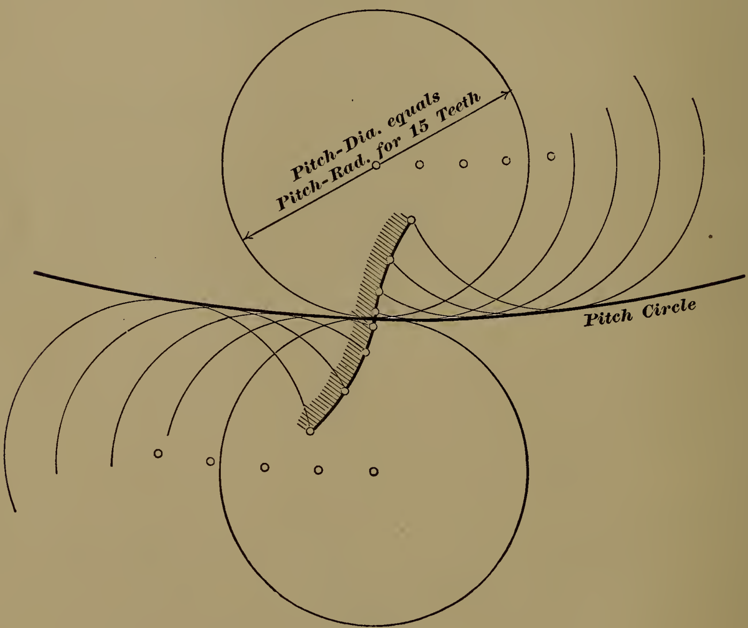


Fig. 2.

In epicycloidal, or double-curve teeth, the formation of the curve changes at the pitch circle. The outline of the faces of epicycloidal teeth may be traced by a point in a circle rolling on the *outside* of pitch circle of a gear, and the flanks by a point in a circle rolling on the *inside* of the pitch circle. The faces of one gear must be traced by the same circle that traces the flanks of the engaging gear.

In our practice the diameter of the rolling or describing circle is equal to the radius of a 15-tooth gear of the pitch required; this is the base of the system. The same describing circle being used for all gears of the same pitch.

The teeth of the rack of this system have double curves, which may be traced by the base circle rolling alternately on each side of the pitch line.

An advantage of the involute over the epicycloidal tooth is, that in action gears having involute teeth may be separated a little from their normal positions without interfering with the angular velocity, which is not possible in any other kind of tooth.

The obliquity of action is sometimes urged as an objection to involute teeth, but a full consideration of the subject will show that the importance of this has been greatly over-estimated.

The tooth dimensions for both the involute and epicycloidal gears may be calculated from the formulas in Chapter IX.

CHAPTER II.

SPUR GEARING.

(Figs. 3, 4.)

Two spur gears in action are comparable to two corresponding plain rollers whose surfaces are in contact, these surfaces representing the pitch circles of the gears.

Pitch of Gears.

For convenience of expression the pitch of gears *may* be stated as follows :

Circular pitch is the distance from the center of one tooth to the center of the next tooth, measured on the pitch line.

Diametral pitch is the number of teeth in a gear per inch of pitch diameter. That is, a gear that has, say, six teeth for each inch in pitch diameter is six diametral pitch, or, as the expression is universally abbreviated, it is " six pitch." This is by far the most convenient way of expressing the relation of diameter to number of teeth.

Module is the pitch diameter of a gear divided by the number of teeth.

Chordal pitch is the distance from center to center of two adjacent teeth at the pitch line measured on the chord.

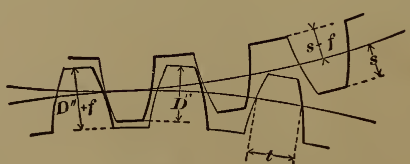
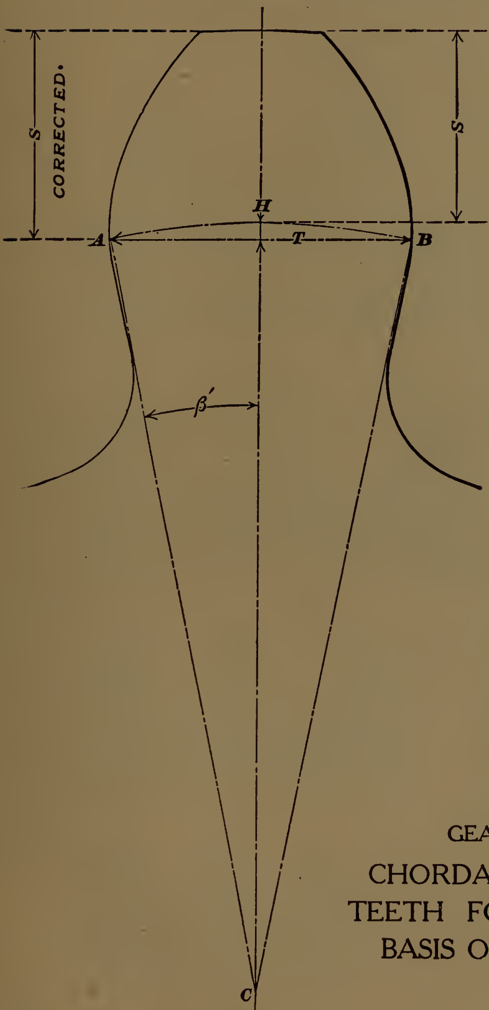


Fig. 3.



CHORDAL THICKNESS OF GEAR TEETH.

The dimensions of Tooth Parts as given in the tables, pages 68 to 71, are correct according to the definition of Tooth Parts; but, as the pitch line of gears is curved, the thickness of a tooth will not be measured on the pitch line if the Caliper is set to the figures given in Tables of Tooth Parts. To measure the tooth accurately the Caliper must be set to the Chordal Thickness.

GEAR TOOTH 1 P.

CHORDAL THICKNESS OF TEETH FOR GEARS ON A BASIS OF 1 DIAMETRAL PITCH.

S = Distance from pitch line to top of teeth.
S Corrected = H + S.
N = Number of teeth in gear.
T = Chordal thickness of Tooth. $T = D' \sin. \beta'$
H = Height of Arc. $H = R\,(1 - \cos. \beta')$
D′ = Pitch Diameter.
R = Pitch Radius.
$\beta' = 90°$ divided by the number of teeth.

NOTE—When the tooth of a gear is measured, add the height of arc to (S).

For tables giving corrected T and corrected S see pages 74 and 75.

FORMULAS.

N = number of teeth.
s = addendum and module.
t = thickness of tooth on pitch line.
f = clearance at bottom of tooth.
D'' = working depth of tooth.
$D'' + f$ = whole depth of tooth.
d = pitch diameter.
d' = outside diameter.
P' = circular pitch.
P = diametral pitch.
C = center distance.
δ = half the angle subtended by the circular pitch.

$$P = \frac{N + 2}{d'}$$

$$P = \frac{\pi}{P'}$$

$$P' = \frac{\pi}{P}$$

$$s = \frac{1}{P} = \frac{P'}{\pi} = .3183\ P'$$

$$s = \frac{d}{N} = \frac{d'}{N + 2}$$

$$t = \frac{1}{2} P' = \frac{\pi}{2\ P}$$

$$f = \frac{1}{10} t$$

$$s + f = \frac{1}{P}\left(1 + \frac{\pi}{20}\right) = .3683\ P'$$

$$D'' = 2\ s \text{ or } \frac{2}{P}$$

$$D'' + f = \frac{2.157}{P} = .6866\ P'$$

$$P^c = d \sin \frac{180^\circ}{N}$$

$$\delta = \frac{180^\circ}{N};\ \sin \delta = \frac{P^c}{d}$$

$$P' = d\pi \frac{\delta}{180^\circ}$$

$$d = \frac{N}{P}$$

$$d' = d + 2\ s$$

$$d = \frac{N\ P'}{\pi}$$

Comparative Sizes of Gear Teeth.
Involute.

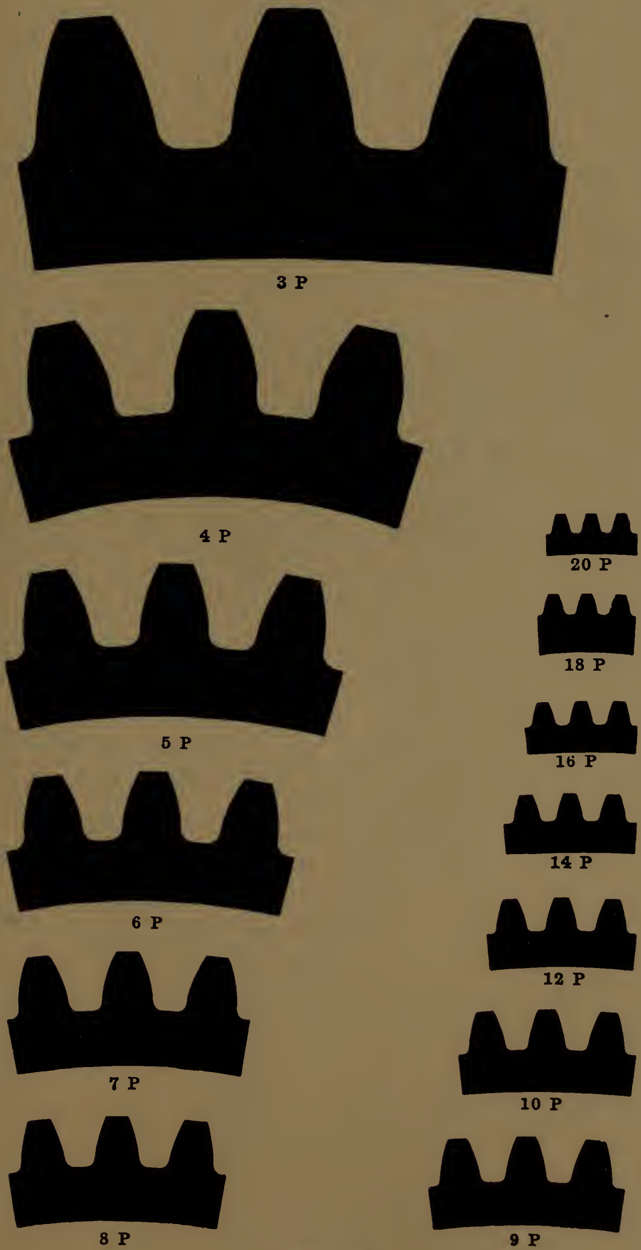


Fig. 4.

CHAPTER III.

BEVEL GEARS.—AXES AT RIGHT ANGLES.

(Fig. 5.)

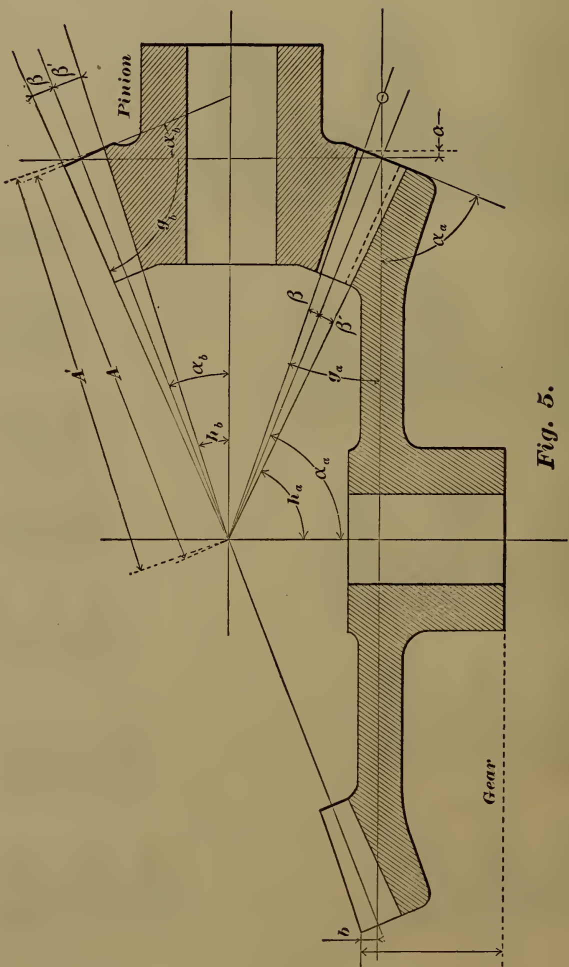


Fig. 5.

FORMULAS.

$$\left.\begin{matrix} N_a = \\ N_b = \end{matrix}\right\} \text{Number of teeth} \left\{\begin{matrix} \text{gear.} \\ \text{pinion} \end{matrix}\right.$$

P = diametral pitch.

P' = circular pitch.

$$\left.\begin{matrix} \alpha_a = \\ \alpha_b = \end{matrix}\right\} \begin{matrix} \text{center angle = angle of edge} \\ \text{or pitch angle} \end{matrix} \left\{\begin{matrix} \text{gear.} \\ \text{pinion.} \end{matrix}\right.$$

β = angle of top.

β' = angle of bottom.

$$\left.\begin{matrix} g_a = \\ g_b = \end{matrix}\right\} \text{angle of face} \left\{\begin{matrix} \text{gear.} \\ \text{pinion.} \end{matrix}\right.$$

$$\left.\begin{matrix} h_a = \\ h_b = \end{matrix}\right\} \text{cutting angle} \left\{\begin{matrix} \text{gear.} \\ \text{pinion.} \end{matrix}\right.$$

A = apex distance from pitch circle.

A' = apex distance from large bottom of tooth.

d = pitch diameter.

d' = outside diameter.

s = addendum and module.

t = thickness of tooth at pitch line.

f = clearance at bottom of tooth.

D'' = working depth of tooth.

$D'' + f$ = whole depth of tooth.

$2a$ = diameter increment.

b = distance from top of tooth to plane of pitch circle.

F = width of face.

$$\tan \alpha_a = \frac{N_a}{N_b}; \quad \tan \alpha_b = \frac{N_b}{N_a};$$

$$\tan \beta = \frac{2 \sin \alpha}{N}; \text{ or } \quad \tan \beta = \frac{s}{A}.$$

$$\tan \beta' = \frac{\sin \alpha \left(2 + \frac{\pi}{10}\right)}{N} = \frac{2.314 \sin \alpha}{N}; \quad \tan \beta' = \frac{s + f}{A};$$

$$g_a = 90^\circ - (\alpha_a + \beta); g_b = 90^\circ - (\alpha_b + \beta)$$

$h = \alpha - \beta'$ (*See Note, page 46.*)

$$A = \sqrt{\left(\frac{N_a}{2P}\right)^2 + \left(\frac{N_b}{2P}\right)^2}$$

$$A = \frac{N}{2 P \sin \alpha}$$

$$A' = \frac{A}{\cos \beta'} \qquad A' = \frac{N}{2 P \sin \alpha \cos \beta'}$$

$$A = \frac{\frac{1}{2} d'}{\sin (\alpha + \beta)} \cos \beta$$

$$P = \frac{N}{2 A \sin \alpha}$$

$$d = \frac{N}{P} \text{ or } = \frac{N P'}{\pi} \qquad d' = d + 2a$$

$2a = 2s \cos \alpha$ (*See pages 78 to 81.*)

$$b = a \tan \alpha \quad \begin{cases} a \text{ for gear} = b \text{ for pinion} \\ a \text{ for pinion} = b \text{ for gear} \end{cases}$$

$$P = \frac{\pi}{P'} \qquad P' = \frac{\pi}{P}$$

$$s = \frac{1}{P} = \frac{P'}{\pi} = .3183 P' \qquad s = A \tan \beta$$

$$s + f = .3685 P' \qquad s + f = A \tan \beta'$$

$$s + f = \frac{1}{P}\left(1 + \frac{\pi}{20}\right) \qquad D'' = 2s$$

$$t = \frac{P'}{2} = \frac{\pi}{2P} \qquad f = \tfrac{1}{10} t$$

$$F = \frac{4}{P} + \frac{A}{7} \text{ or } = 2P' \text{ to } 3P'$$

NOTE.—Formulas containing notations without the designating letters a and b apply equally to either gear or pinion. If wanted for one or the other, the respective letters are simply attached.

BEVEL GEARS WITH AXES AT ANY ANGLE.

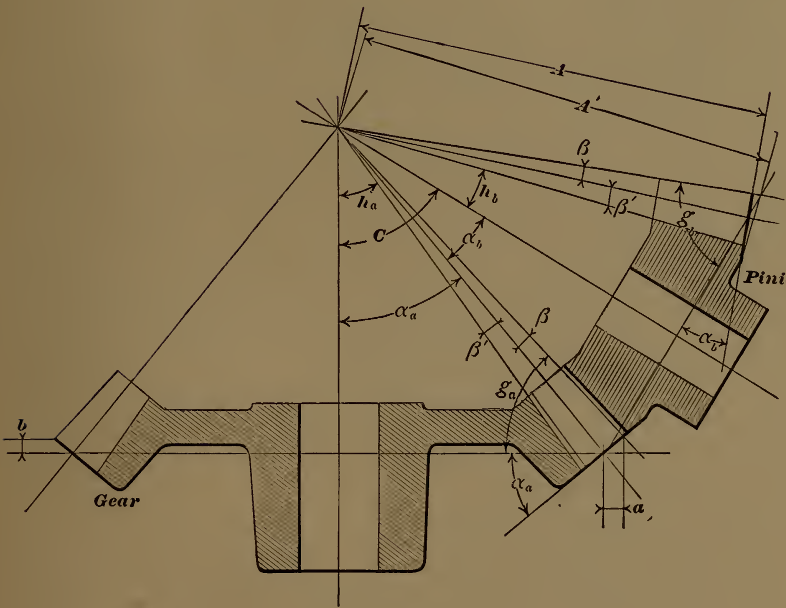


Fig. 6.

FORMULAS.

C = angle formed by axes of gears.

$\left.\begin{array}{l} N_a = \\ N_b = \end{array}\right\}$ number of teeth $\left\{\begin{array}{l}\text{gear.}\\ \text{pinion.}\end{array}\right.$

P = diametral pitch.

P' = circular pitch.

$\left.\begin{array}{l} \alpha_a = \\ \alpha_b = \end{array}\right\}$ angle of edge = pitch angle $\left\{\begin{array}{l}\text{gear.}\\ \text{pinion.}\end{array}\right.$

β = angle of top.

β' = angle of bottom.

$\left.\begin{array}{l} g_a = \\ g_b = \end{array}\right\}$ angle of face $\left\{\begin{array}{l}\text{gear.}\\ \text{pinion.}\end{array}\right.$

$\left.\begin{array}{l} h_a = \\ h_b = \end{array}\right\}$ cutting angle $\left\{\begin{array}{l}\text{gear.}\\ \text{pinion.}\end{array}\right.$

A = apex distance from pitch circle.

A' = apex distance from large bottom of tooth.

d = pitch diameter.

d' = outside diameter.

$2a$ = diameter increment.

b = distance from top of tooth to plane of pitch circle.

NOTE.—The formulas for tooth parts as given on page 14 apply equally to these cases.

$$\tan \alpha_a = \frac{\sin C}{\frac{N_b}{N_a} + \cos C}; \text{ or } \cot \alpha_a = \frac{N_b}{N_a \sin C} + \cot C$$

$$\tan \alpha_b = \frac{\sin C}{\frac{N_a}{N_b} + \cos C}; \text{ or } \cot \alpha_b = \frac{N_a}{N_b \sin C} + \cot C$$

NOTE.—The above formulas are correct only for values of C less than 90°. If C is greater than 90°, consult page 23.

$$\tan \beta = \frac{2 \sin \alpha}{N}; \quad \text{or } \tan \beta = \frac{s}{A};$$

$$\tan \beta' = \frac{\sin \alpha \left(2 + \frac{\pi}{10}\right)}{N} = \frac{2.314 \sin \alpha}{N}; \ \tan \beta' = \frac{s+f}{A};$$

$g_a = 90° - (\alpha_a + \beta)$ for Cases I and II.

$g_a = \beta$, for Case III.

$g_a = 90° - (\alpha_a - \beta)$ for Case IV.

$g_b = 90° - (\alpha_b + \beta)$

$h = \alpha - \beta'$ *(See page 46.)*

$$A = \frac{N}{2 P \sin \alpha}$$

$$A' = \frac{A}{\cos \beta'}$$

$$d = \frac{N}{P} \text{ or } = \frac{N P'}{\pi}$$

$d' = d + 2a$ { for Cases I and II, and pinions in Cases III and IV.

$d' = d$, for gear in Case III.

$d' = d - 2a$, for gear in Case IV.

$2a = 2s \cos \alpha$

$b = s \sin \alpha$

NOTE.—Formulas containing notations without the designating letters *a* and *b* apply equally to either gear or pinion. If wanted for one or the other, the respective letters are simply attached.

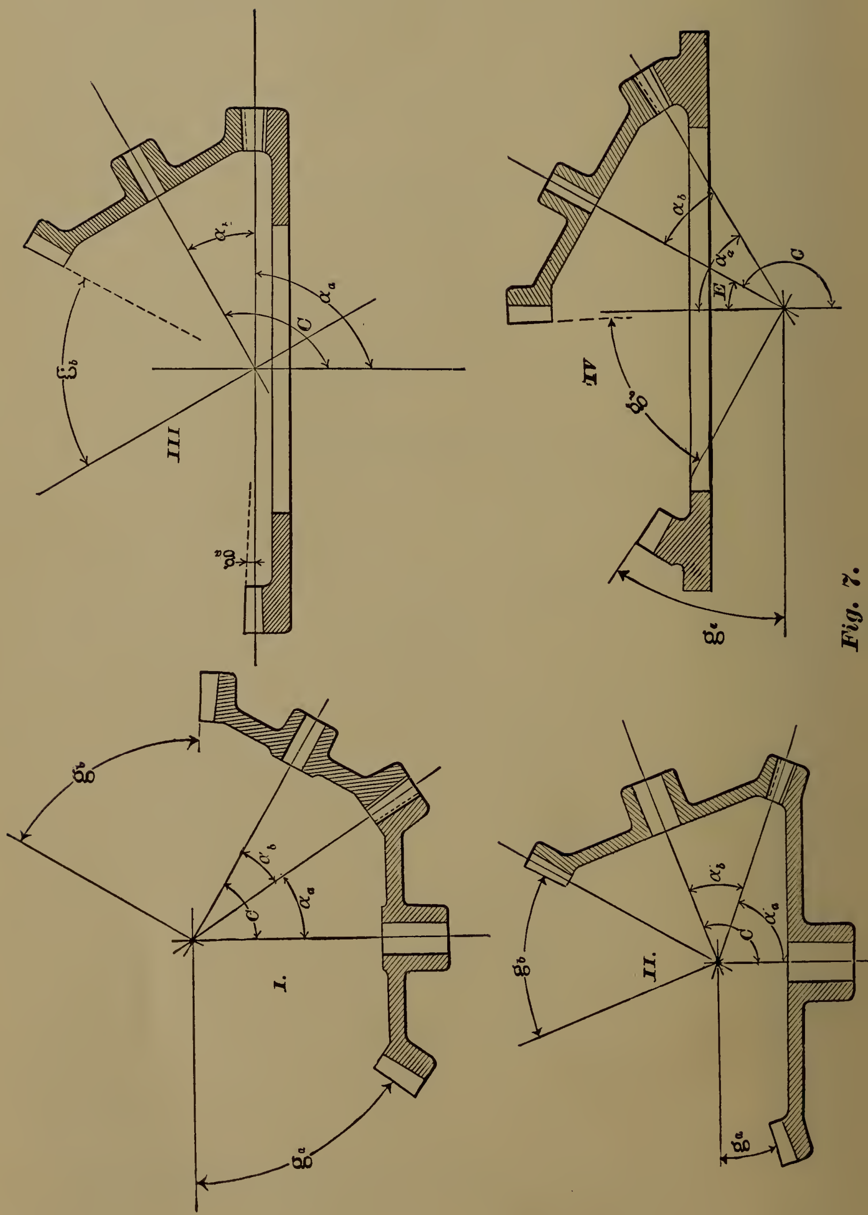


Fig. 7.

The formulas given for α_a and α_b (when C, N_a and N_b are known) undergo some modifications for values of C greater than 90°.

For bevel gears at any angle but 90° we may distinguish four cases; C, N_a, N_b being given.

I. Case. See pages 19 and 21.

II. Case. C is greater than 90°.

$$\tan \alpha_a = \frac{\sin (180 - C)}{\frac{N_b}{N_a} - \cos (180 - C)} ; \quad \tan \alpha_b = \frac{\sin (180 - C}{\frac{N_a}{N_b} - \cos (180 - C)}$$

III. Case. $\alpha_a = 90°$; $\alpha_b = C - 90°$

IV. Case.

$$\tan \alpha_a = \frac{\sin E}{\cos E - \frac{N_b}{N_a}} ; \quad \tan \alpha_b = \frac{\sin E}{\frac{N_a}{N_b} - \cos E}$$

For an example to apply to Case III., the following condition must be fulfilled:

$$N_a \sin (C - 90°) = N_b$$

To distinguish whether a given example belongs to Case II. or case IV., we are guided by the following condition:

Is : $N_a \sin (C - 90°) \begin{cases} \textit{smaller} \text{ than } N_b, \text{ we have Case II.} \\ \textit{larger} \text{ than } N_b, \text{ we have case IV.} \end{cases}$

Diameter Increment.

The ratio being given or determined, to find the outside diameter, divide the figures given in table, pages 78 to 81, for gear and pinion by pitch (P) and add the quotient to the pitch diameter.

Example.—Required, the outside diameters of a pair of bevel gears, 10 P, 35 T into 23 T. Referring to the table, the diameter increments are found to be for the gear 1.10 and for the pinion 1.67.

1.10 ÷ 10 = .110; 3.5 pitch diameter + .110 = 3.610 outside diameter of gear.

1.67 ÷ 10 = .167; 2.3 pitch diameter + .167 = 2.467 outside diameter of pinion.

UNDERCUT IN BEVEL GEARS.

By undercut in gears is understood a special formation of the tooth, which may be explained by saying that the elements of the tooth below the pitch line are nearer the center line of the tooth than those on the pitch line. Such a tooth outline is to be found only in gears with few teeth. In a pair of bevel gears where the pinion is low-numbered and the ratio high, we are apt to have undercut. For a pair of running gears this condition presents no objection. Should, however, these gears be intended as patterns to cast from, they would be found useless, from the fact that they would not draw out of the sand. We have stated on page 10 (see Fig. 1) that the base of our involute system is the 14½° pressure angle. If a pair of bevel gears with teeth constructed on this basis have undercut, we can nearly eliminate the undercut—and for the practical working this is quite sufficient—by taking as a basis for the construction of the tooth outline a pressure angle of 20°.

The question now is: When do we and when do we not have undercut? Let there be:

N = number of teeth in gear.

n = number of teeth in pinion.

$$\frac{n\sqrt{N^2 + n^2}}{N} = p$$

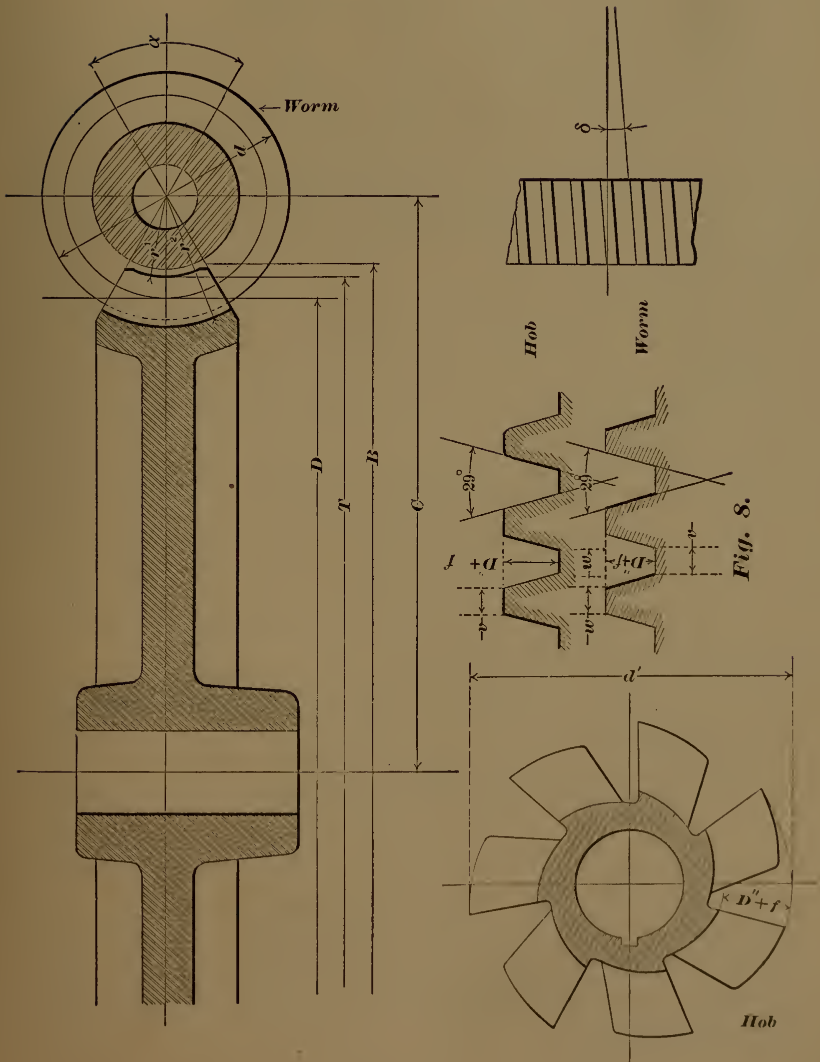
where we have undercut for p less than 30.

This formula is strictly correct for epicycloidal gears only. It is, however, used as a safe and efficient approximation for the involute system.

CHAPTER IV.

WORM AND WORM WHEEL.

(Fig. 8.)



FORMULAS.

L = lead of worm.

N = number of teeth in gear.

m = turns per inch of worm.

d = diameter of worm.

d' = diameter of hob.

T = throat diameter.

B = blank diameter (to sharp corners).

C = distance between centers.

o = thickness of hob-slotting cutter.

l = width of lands at bottom.

b = pitch circumference of worm.

v = width of worm thread tool at end.

w = width of worm thread at top and width of hob tool at end.

P = diametral pitch.

P^1 = circular pitch for worm wheels or axial pitch for worms.

D = pitch diameter of worm wheel.

$\left.\begin{matrix} r^1 \\ r^2 \end{matrix}\right\}$ See figure 8.

s = addendum and module.

t = thickness of tooth at pitch line.

t^n = normal thickness of tooth.

f = clearance at bottom of tooth.

D'' = working depth of tooth.

$D'' + f$ = whole depth of tooth.

δ = angle of tooth of worm wheel with its axis, or the angle of thread of worm with a line at right angles to its axis.

If the lead is for single, double, triple, etc., thread, then

$$L = P',\ 2\ P',\ 3\ P', \text{ etc.}$$

In multiple threaded worms and their mating wheels, if the angle δ is more than 15° the tooth parts should be figured on the normal as for spiral gears. In using the formulas for spiral gears, it should be borne in mind that while P' is the axial pitch for worms it is the circular pitch for spiral gears.

$\alpha = 60^\circ$ to 90°

$L = \frac{1}{m}$

$P' = \frac{\pi T}{N + 2}$

$D = \frac{N P'}{\pi} = \frac{N}{P}$

$T = \frac{N}{P} + 2s$

$b = \pi(d - 2s)$

$\tan \delta = \frac{L}{b}$ $\Big\{$ Practical only when width of wheel on wheel pitch circle is not more than ⅔ pitch diameter of worm.

$t^n = t \cos \delta$

$r^1 = \frac{d}{2} - 2s$

$r^2 = r^1 + D'' + f$

$C = \frac{D + d}{2} - s$

$B = T + 2\left(r^1 - r^1 \cos \frac{\alpha}{2}\right)$ A measurement of sketch is generally sufficient.

$d' = d + 2f$

$v = .31 P'$

$w = .335 P'$

NOTE.—The notations and formulas referring to tooth parts, given on page 14 for spur gears, apply to worm wheels, and are here used.

NOTE.—Hob and worm should be marked, as per example:

4 turns per 1″ single .25 P′; .25 L.
2 turns per 1″ double .25 P′; .50 L.

UNDERCUT IN WORM WHEELS.

In worm wheels of less than 30 teeth the thread of the worm (being 29°) interferes with the flank of the gear tooth. Such a wheel finished with a hob will have its teeth undercut. To avoid this interference two methods may be employed.

First Method.—Make throat diameter of wheel

$$T = \cos^2 14\tfrac{1}{2}^\circ \frac{N}{P} + 4s \qquad \text{or}$$

$$T = \frac{.937\ N}{P} + 4s$$

This formula increases the throat diameter, and consequently the center distance. The amount of the increase can be found by comparing this value of T with the one as obtained by formula on page 27. To keep the original center distance, the outside diameter of the worm must be reduced by the same amount the throat diameter is increased.

Second Method.—Without changing any of the dimensions we found by the formulas given on page 27, we can avoid the interference to be found in worm wheels of less than 30 teeth by simply increasing the angle of worm thread. We find the value of this angle by the following formula:

Let there be

$2\,\gamma$ = angle of worm thread.
N = number of teeth in worm wheel.

$$\cos \gamma = \sqrt{1 - \frac{2}{N}}$$

From this formula we obtain the following values:

N	29	28	27	26	25	24	23	22	21	20
$2\,\gamma$	30¼	31	31½	32¼	32¾	33½	34¼	35	36	37

N	19	18	17	16	15	14	13	12
$2\,\gamma$	38	39	40	41½	42¾	44½	46¼	48

As this latter formula involves the making of new hobs in many cases, on account of change of angle, we prefer to reduce the diameter of worm as indicated by first method, if the distance of centers must be absolute.

CHAPTER V.

SPIRAL OR SCREW GEARING.

(Figs. 9, 10, 11.)

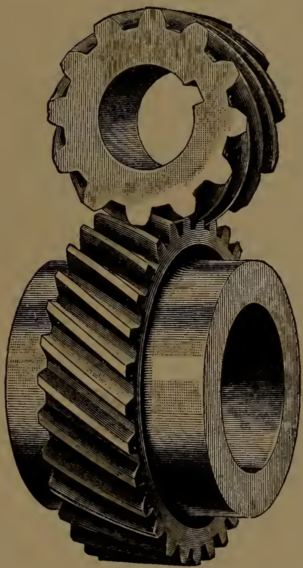


Fig. 9.

RIGHT HAND SPIRAL GEARS.

In spiral gearing the wheels have cylindrical pitch surfaces, but the teeth are not parallel to the axis. The line in which the pitch surface intersects the face of a tooth is part of a screw line, or helix, drawn at the pitch surface. A screw wheel may have one or any number of teeth. A one-toothed wheel corresponds to a one-threaded screw, a many-toothed wheel to a many-threaded screw. The axes may be placed at any angle.

Consider spiral gears with :

I. Axes parallel.
II. Axes at right angles.
III. Axes any angle.

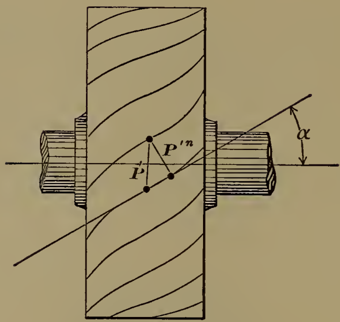


Fig. 10.

LEFT HAND SPIRAL GEAR.

Let there be:

$\left.\begin{matrix} N_a = \\ N_b = \end{matrix}\right\}$ number of teeth in gears $\left\{\begin{matrix} a \\ b \end{matrix}\right.$

C = center distance.

P' = circular pitch (circumferential not axial).

P^n = normal diametral pitch.

P'^n = normal circular pitch.

γ = angle of axes.

L_1 = exact lead of spiral on pitch surface.

L_2 = approximate lead of spiral on pitch surface.

T = number of teeth marked on cutter to be used when teeth are to be cut on milling machine.

D = pitch diameter.

B = blank diameter.

$\left.\begin{matrix} \alpha_a = \\ \alpha_b = \end{matrix}\right\}$ angle of teeth with axis

t = thickness of tooth.

s = addendum and module.

$D'' + f$ = whole depth of tooth.

NOTE.—Letters a and b occurring at bottom of notations refer to gears a and b.

I.—AXES PARALLEL.

Gears of this class are called twisted gears. The angle of teeth with axes in both gears must be equal and the spirals run in opposite directions. The angles are generally chosen small (seldom over 20°) to avoid excessive end thrust. End thrust may, however, be entirely avoided by combining two pairs of wheels with right and left-hand obliquity. Gears of this class are known as Herringbone gears. They are comparatively noiseless running at high speed.

II.—Axes at Right Angles.

Here we must always have:

1. The teeth of same hand spiral;
2. The normal pitches equal in both gears; and
3. The sum of the angles of teeth with axes = 90°.

Choosing Angle of Teeth with Axes.

1. If in a pair of gears the ratio of the number of teeth is equal to the direct ratio of the diameters, *i. e.*, if the number of teeth in the two gears are to each other as their pitch diameters, then the angles of the spirals will be 45° and 45°; for, this condition being fulfilled, the circular pitches of the two gears must be alike, which is only possible with angles of 45°. In such a combination either gear may be the driver.

2. If the ratio of the diameters determined upon is larger or smaller than the ratio of the number of teeth, then the angles are:

$$\tan \alpha_a = \frac{D_a\, N_b}{D_b\, N_a} \qquad \tan \alpha_b = \frac{D_b\, N_a}{D_a\, N_b}$$

In such gears the velocity ratio is measured by the number of teeth, and not by the diameters.

3. Given N_a, N_b and C:
If P_a' is made $= P_b'$, then we have case "1" and

$$P' = \frac{\pi C}{\frac{1}{2}(N_a + N_b)}$$

But if P_a' is assumed, then:

$$P_b' = \frac{C\,\pi - \frac{1}{2}\,N_a\,P_a'}{\frac{1}{2}\,N_b}$$

and

$$\tan \alpha_a = \frac{P_a'}{P_b'} \qquad \tan \alpha_b = \frac{P_b'}{P_a'}$$

The gear whose P′ or α is larger will ordinarily be the driver, on account of the greater obliquity of the teeth.

4. Given N_a, N_b and C or D.
See case "7" under III., considering $\gamma = 90°$.

III.—Axis at any Angle (γ).

5. Given case "1," under II., then angles of spirals $= \frac{1}{2}\gamma$, for the same reason.

6. Analogous cases to "2" and "3," under II., may be worked out, when angles of axes $= \gamma$, but they have been

omitted, partly because the formulas are too cumbersome, and partly because they are to some extent covered by cases "5" and "7."

7. Given N_a, N_b and C, or one of the pitch diameters. We find the angles by a graphic method, which for all practical purposes is accurate enough ; *r o* and *v o* are the axes of gears forming angle γ (see diagram, Fig. 11.) On these axes we lay off lines *o r* and *o v* representing the ratio of the number of teeth (velocity ratio), so that $N_a : N_b :: r\,s : s\,v$, and

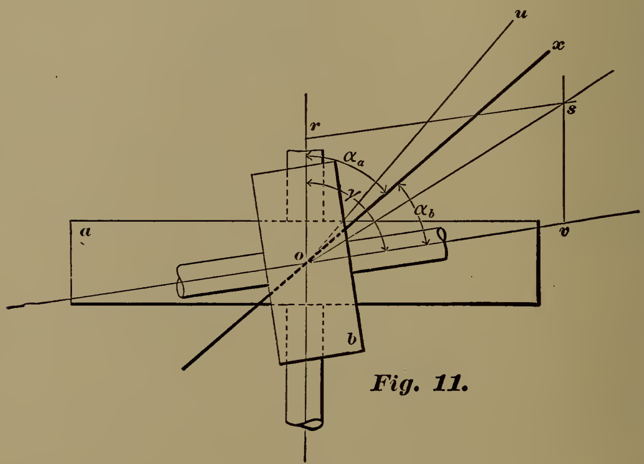


Fig. 11.

construct parallelogram *o r s v*. Then, according to McCord,* the angles formed by the tangent *s o* in the pitch contact *o* with the axes of the gears insures *the least amount of sliding*. In bisecting angle γ by tangent *u o* and using angles produced in this manner we *equally distribute the end thrust* on both shafts. Both methods have their advantages ; to profit by both we select angles α_a and α_b, produced by tangent *o x*, bisecting angle *u o s*.

Thus we have when angles are found and C given,

$$P'^n = \frac{2\,C\,\pi \cos\alpha_a \cos\alpha_b}{N_a \cos\alpha_b + N_b \cos\alpha_a}$$

and when D_a given

$$P'^n = \frac{D_a\,\pi \cos\alpha_a}{N_a} \quad \text{and}$$

$$D_b = \frac{P'^n\,N_b}{\pi \cos\alpha_b}$$

* McCord, Kinematics, page 278.

General Formulas.

$$\gamma = \alpha_a + \alpha_b$$

$$P_a{}'^n = P_b{}'^n$$

$$D = \frac{P' N}{\pi} \quad \text{or} = \frac{P'^n N}{\pi \cos \alpha}$$

$$B = D + 2s \quad \text{or} = D + \frac{2}{P^n}$$

$$P' = \frac{D \pi}{N} \quad \text{or} = \frac{P'^n}{\cos \alpha}$$

$$P'^n = P' \cos \alpha$$

$$P^n = \frac{\pi}{P'^n} \quad \text{(Pitch of cutter.)}$$

$$s = \frac{P'^n}{\pi} \quad \text{or} = \frac{1}{P^n}$$

$$t = \frac{P'^n}{2}$$

$$D'' + f = 2s + \frac{t}{10}$$

$$T = \frac{N}{\cos^3 \alpha} \qquad \textit{(See Note 1.)}$$

$$L_1 = \frac{N P'}{\tan \alpha} \quad \text{or} \quad \frac{N \pi}{P \tan \alpha} \quad \text{or} \quad \begin{cases} L_{1a} = N_a P'_b \\ L_{1b} = N_b P'_a \end{cases}$$

$$L_2 = \frac{10\, W\, G_2}{S\, G_1} \qquad \textit{(See Note 2 and examples.)}$$

$$\left(\begin{array}{l} \cos 45^\circ = .70711 \\ \cos^3 45^\circ = .3535 \\ \tan 45^\circ = 1.000 \end{array} \right)$$

Note 1.—Cutters of regular involute system.

Use No. 1 cutter for T from	135 up.	No. 5 cutter for T from	21 to 25
" 2 " " " "	55 to 134	" 6 " " " "	17 to 20
" 3 " " " "	35 to 54	" 7 " " " "	14 to 16
" 4 " " " "	26 to 34	" 8 " " " "	12 to 13

Note 2.—Gears used on spiral head and bed for Brown & Sharpe milling machine:

W = number of teeth in gear on worm.
G_1 = " " 1st " stud.
G_2 = " " 2d " stud.
S = " " " screw.

Should a spiral head of different construction be used, the formula might not apply.

The following data are usually required in cutting spiral gears in a Universal Milling Machine, and it will be found convenient to arrange them in tabular form as follows:

	GEAR.	PINION.
No. of Teeth - - - - - - - - -		
Pitch Diameter - - - - - - - - -		
Outside Diameter - - - - - - - -		
Circular Pitch - - - - - - - - -		
Angle of Teeth with Axis - - - - -		
Normal Circular Pitch - - - - - -		
Pitch of Cutter - - - - - - - - -		
Addendum s - - - - - - - - -		
Thickness of Tooth t - - - - - -		
Whole Depth $D'' + f$ - - - - - - -		
No. of Cutter - - - - - - - - -		
Exact Lead of Spiral - - - - - - -		
Approximate Lead of Spiral - - - -		
Gears on Milling Machine to Cut Spiral		
Gear on Worm - - - - - - - - -		
1st Gear on Stud - - - - - - - -		
2nd Gear on Stud - - - - - - - -		
Gear on Screw - - - - - - - - -		

If the exact lead L_1 can be obtained by the gears at hand, L_1 will equal L_2 and we shall have from the formula

$$L_2 = \frac{10\ W\ G_2}{S\ G_1}$$

$$\frac{L_1}{10} = \frac{W\ G_2}{S\ G_1} \quad \text{(for B. \& S. Milling Machine.)}$$

Example I.

Required the gears for cutting a spiral of $2\frac{1}{2}''$ lead.

$\frac{2\frac{1}{2}}{10} = \frac{1}{4}$ factoring, in the most simple way, we have

$$\frac{1}{4} = \frac{1 \times 1}{2 \times 2} = \frac{1 \times 28}{56 \times 2} = \frac{32 \times 28}{56 \times 64} = \frac{W\ G_2}{S\ G_1}$$

Thus the gearing will be 32 T. on worm, 64 T. 1st. on stud, 28 T. 2nd on stud, and 56 T. on screw.

Trying these gears on the Milling Machine we find that they cannot be used, and as we have no other regular gears in the ratio of 2 to 1 that can be used we must try, by factoring, to get such ratios for the two pairs of gears as to be able to use the gears at hand, bearing in mind that the combined ratio must be $\frac{1}{4}$.

$$\frac{1}{4} = \frac{18}{72} = \frac{3 \times 6}{9 \times 8} = \frac{24 \times 6}{9 \times 64} = \frac{24 \times 48}{72 \times 64}$$

These gears are at hand and the combination can be used on the machine, giving the exact lead of $2\frac{1}{2}''$.

Example II.

Required the gears for cutting a spiral of $8.639''$ lead.

$8.639 = 8\frac{639}{1000}$; reducing, by continued fractions, to a smaller fraction of approximately the same value, as described on pages 50 and 51

```
639 ) 1000 ( 1
      639
      361 ) 639 ( 1
            361
            278 ) 361 ( 1
                  278
                   83 ) 278 ( 3
                        249
                         29 ) 83 ( 2
                              58
                              25 ) 29 ( 1
                                   25
                                    4 ) 25 ( 6
                                        24
                                         1 ) 4 ( 4
                                             4
```

$$\begin{array}{cccccccc} 1 & 1 & 1 & 3 & 2 & 1 & 6 & 4 \\ \hline \frac{1}{1} & \frac{1}{2} & \frac{2}{3} & \frac{7}{11} & \frac{16}{25} & \frac{23}{36} & \frac{154}{241} & \frac{639}{1000} \end{array}$$

Selecting $\frac{16}{25}$ as an approximation near enough for our purpose, and in fact as near as we are likely to find gears for, we have for our lead $8\frac{16}{25}$. Applying the formula as in Example I.

$$\frac{8\frac{16}{25}}{10} = \frac{W\ G_2}{S\ G_1}$$

$$\frac{8\frac{16}{25}}{10} = \frac{216}{250} = \frac{108}{125} \text{ factoring we have}$$

$$\frac{9 \times 12}{25 \times 5} = \frac{9 \times 48}{100 \times 5} = \frac{72 \times 48}{100 \times 40} \text{ the gears required,}$$

these being regular gears furnished with the Milling Machine.

Proof:

$$\frac{72 \times 48 \times 10}{100 \times 40} = 8.640 = L_2$$

$$8.639 = L_1$$

$$.001'' \text{ error in lead.}$$

In shops where much work is done in milling spirals it is desirable to have a full set of gears for the milling machine, from the smallest to the largest numbers of teeth that can be used. This makes it possible, in most cases, to get closer approximations than could be otherwise obtained, and often saves a great deal of figuring.

When the use of continued fractions does not bring a close enough approximation, one method to secure a closer result is to add to or substract from the numerator and denominator of the fraction to be reduced, any numbers nearly in proportion to the given fraction, seeing that the numbers added or substracted are such as to make the fraction reducible to lower terms. By a little ingenuity and patience extremely close approximations can generally be reached in this way.

Take, as an illustration, the fraction in Example II.

$$\frac{8\frac{639}{1000}}{10} = \frac{8639}{10000}$$

Adding 9 to the numerator and 10 to the denominator, these

being in about the same ratio to each other as the numerator and denominator of the fraction, we have

$$\frac{8639+9}{10000+10} = \frac{8648}{10010} = \frac{4324}{5005} = \frac{47 \times 92}{55 \times 91}$$

All of the gears in this case are special.

Applying the same proof as in Example II. we find that this train of gears will give a lead of 8.6393+, making an error of .0003″ in the lead.

No doubt a much closer approximation even than this could be obtained by further trial.

Another method is to multiply both terms of the fraction by some number which will make one term of the fraction easily reducible, and adding one to or subtracting it from the other term to make it possible to reduce that also.

There is an element of uncertainty in both these methods, as we never feel sure that we have obtained the best combination; practical work, however, rarely requires accuracy beyond a point that can readily be reached.

The tables of prime numbers and factors, pages 121 to 155, will be found convenient in reducing and factoring fractions. These tables are condensed as much as possible and give all numbers from 1 to 10,200.

CHAPTER VI.

INTERNAL GEARING.

PART A.—INTERNAL SPUR GEARING.

(Figs. 12, 13, 14, 15, 16.)

A little consideration will show that a tooth of an internal or annular gear is the same as the space of a spur—external gear.

The epicycloidal form of tooth is preferable for internal gears, as there is less difficulty in overcoming the interferences. The involute form of tooth can be used by changing the pressure angle beyond the limit of interference. Special constructions are required when the difference between the number of teeth in gear and pinion is small.

In using the system of epicycloidal form of tooth in which the gear of 15 teeth has radial flanks, this difference must be at least 15 teeth, if the teeth have both faces and flanks. Gears fulfilling this condition present no difficulties. Their pitch diameters are found as in regular spur gears, and the inside diameter is equal to the pitch diameter, less twice the addendum.

If, however, this difference is less than 15, say 6, or 2, or 1, then we may construct the tooth outline (based on the epicycloidal system) in two different ways.

First Method.—To explain this method better, let us suppose the case as in Fig. 12, in which the difference between gear and pinion is more than 15 teeth. Here the point o of the describing circle B (the diameter of which in the best practice of the present day is equal to the pitch radius of a 15 tooth gear, of the same pitch as the gears in question) generates the cycloid o, o^1, o^2, o^3, etc., when rolling on pitch circle L L of gear, forming the face of tooth ; and when rolling on the outside of L L the flank of the tooth. In like manner is the face and flank of the pinion tooth produced by B rolling outside and inside of E E (pitch circle of pinion). A little study

of Fig. 12 (in which the face and flank of a gear tooth are produced) will show the describing circle B divided into 12

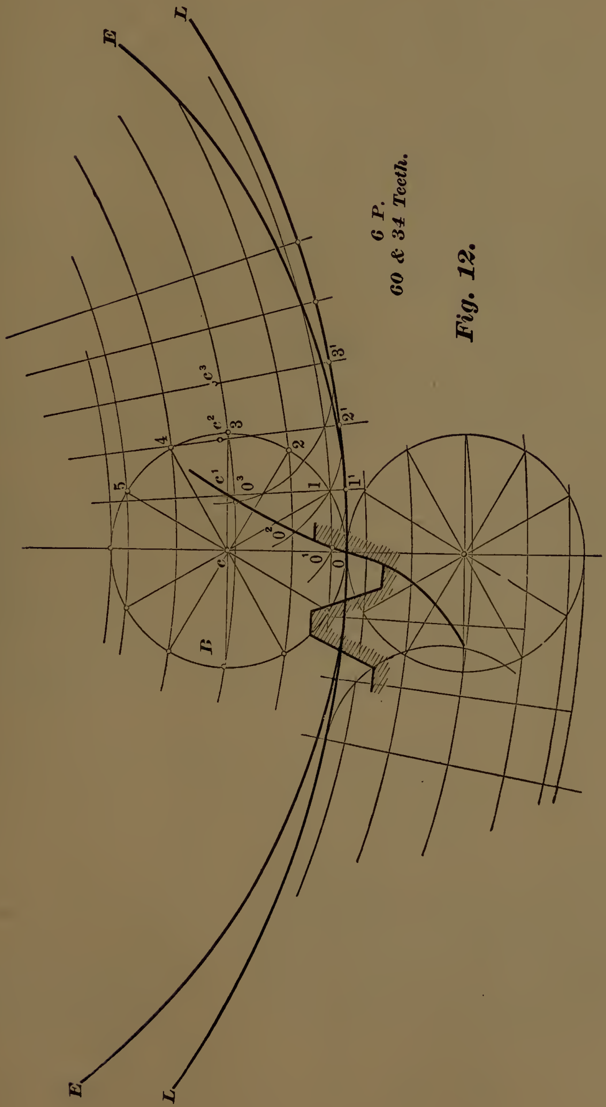


Fig. 12.

equal parts and circles laid through these points (1, 2, 3, etc.), concentric with L L. We now lay off on L L the distances 0–1, 1–2, 2–3, etc., of the circumference of B, and obtain points

1^1, 2^1, 3^1, etc. [Ordinarily it is sufficient to use the chord.] It will now readily be seen that B in rolling on L L will successively come in contact with 1^1, 2^1, 3^1, etc., *c* meanwhile moving to c^1, c^2, c^3, etc. (points on radii through 1^1, 2^1, 3^1, etc.), and the generating point o advancing to o^1, o^2, o^3, etc., being the intersections of B with c^1, c^2, c^3, etc., as centers and the circles laid through 1, 2, 3, etc. Points o, o^1, o^2, o^3, etc., connected with a curve give the face of the tooth ; in like manner the flank is obtained.

In this manner the form of tooth is obtained, when the difference of teeth in gear and pinion is less than 15, with the exception that the diameter of describing circle B

$$= \tfrac{1}{2}\left(\frac{\text{Na} - \text{Nb}}{\text{P}}\right)$$

where P = diametral pitch, Na and Nb number of teeth in gears.

The distances of the tooth above and below the pitch line as well as the thickness *t* are determined as in regular spur gears by the pitch, except when the difference in gear and pinion is very small, where we obtain a short tooth, as in Figs. 13 and 14. In such a case the height of tooth is arbitrary and only conditioned by the curve. In internal gears it is best to allow more clearance at bottom of tooth than in ordinary spur gears.

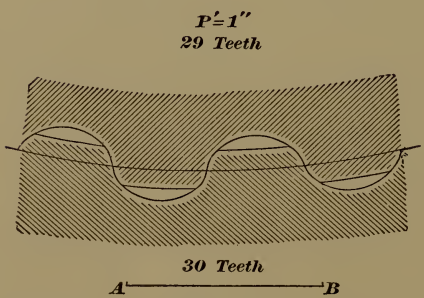


Fig. 13.

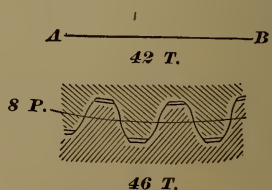


Fig. 14.

In a construction of this kind it is suggested to draw the tooth outline many times full size and reduce by photography. An equally multiplied line A B will help in reducing.

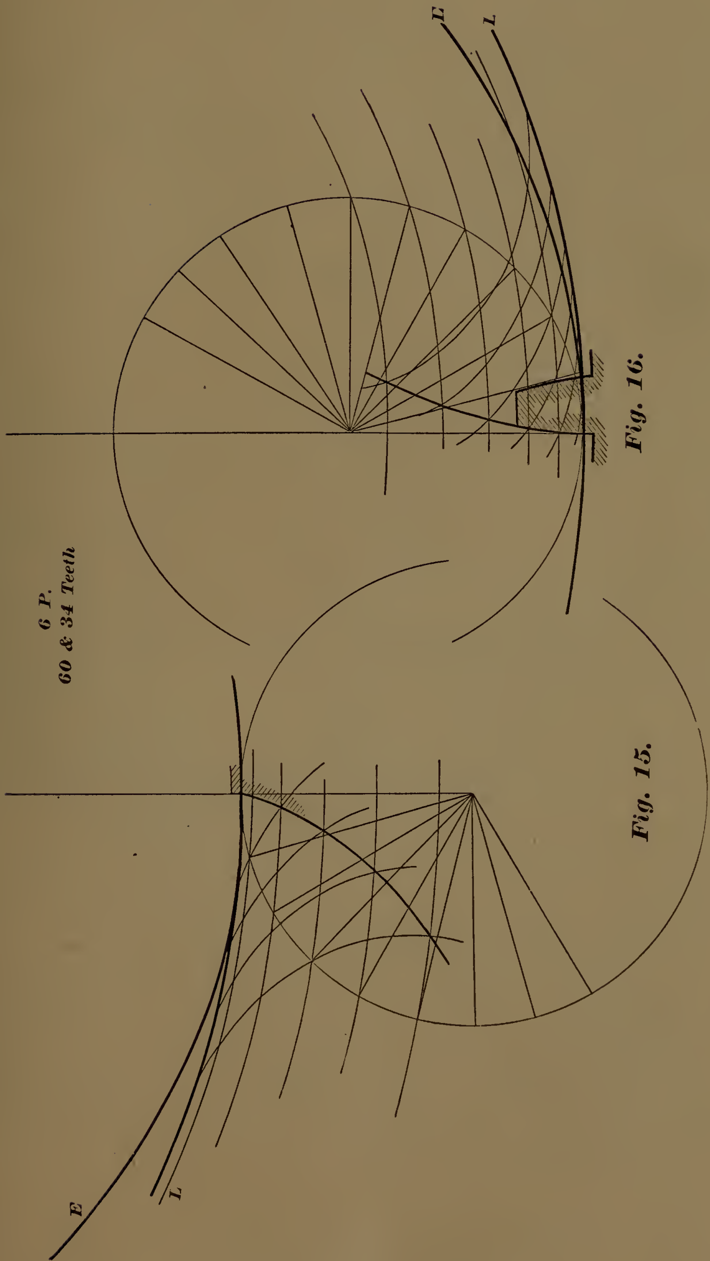


Fig. 16.

Fig. 15.

Second Method.—The difference between gear and pinion being very small, it is sometimes desirable to obtain a smooth action by avoiding what is termed the "friction of approaching action."* This is done, the *pinion driving*, by giving gear only flanks, Fig. 15, and the *gear driving*, by giving gear only faces, Fig. 16. In both these cases we have but one describing circle, whose diameter is equal to the difference of the two pitch diameters. The construction of the curve is precisely the same as described under A. The describing circle has been divided into 24 parts simply for the sake of greater accuracy.

PART B.—INTERNAL BEVEL GEARS.

(Fig. 17.)

The pitch surfaces of bevel gears are cones whose apexes are at a common point, rolling upon each other. The tooth forms for any given pair of bevel gears are the same as for a pair of spur gears (of same pitch) whose pitch radii are equal to the respective apex distances of the normal cones (*i. e.*, cones whose elements are perpendicular upon the elements of the bevel gear pitch cones). (Compare Fig 19, page 45.)

The same is true of internal bevel gears, with the modification that here one of the pitch cones rolls inside of the other. The spur gears to whose tooth forms the forms of the bevel gear teeth correspond, resolve themselves into internal spur gears (Fig. 17). The problem is now to be solved as indicated in the first part of this chapter.

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* McCord, Kinematics, pages 107, 108.

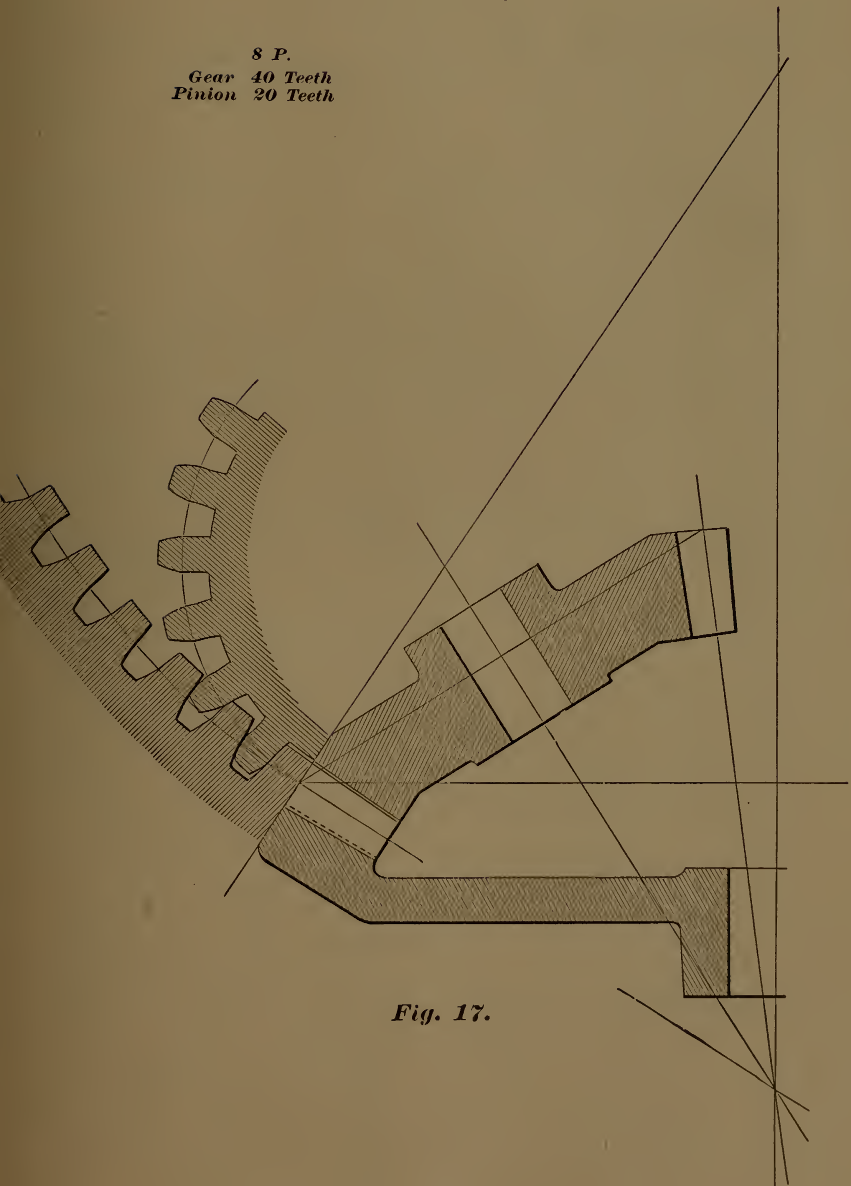


Fig. 17.

CHAPTER VII.

DIMENSIONS AND FORM FOR BEVEL GEAR CUTTERS.

(Fig. 19.)

The data needed to determine the form and thickness of a bevel gear cutter are the following :

P = pitch.
Na = number of teeth in gear.
Nb = number of teeth in pinion.
F = length of face of tooth, measured on pitch line.

After having laid out a diagram of the pitch cones *a b c* and *a b f*, and laid off the width of face, the problem resolves itself into two parts :

PART I.—DETERMINE PROPER CURVE FOR CUTTER.

It will be remembered that in the involute system of cutters (the only one used for bevel gears that are cut with rotary cutter), a set of eight different cutters is made for each pitch, numbering from No. 1 to No. 8, and cutting from a rack to 12 teeth. Each number represents the form of a cutter suitable to cut the indicated number of teeth. For instance, No. 4 cutter (No. 4 curve) will cut 26 to 34 teeth. In order to find the curve to be used for gear and pinion we simply construct the normal pitch cones by erecting the perpendicular *p q* through *b*, Fig. 19. We now measure the lines *b q* and *b p*, and taking them as radii, multiplying each by 2 and P we obtain a number of teeth for which cutters of proper curves may be selected. From example we have :

Gear : $b\,q = 9\frac{3}{4}''$; $2 \times P \times 9.75 = 98$ T No. 2 curve.
Pinion : $b\,p = 3\frac{1}{2}''$; $2 \times P \times 3.5 = 35$ T No. 3 curve.

The eight cutters which are made in the involute system for each pitch are as follows :

No. 1	will cut	wheels	from	135	teeth	to a	rack.
" 2	"	"	"	55	"	"	134 teeth.
" 3	"	"	"	35	"	"	54 "
" 4	"	"	"	26	"	"	34 "
" 5	"	"	"	21	"	"	25 "
" 6	"	"	"	17	"	"	20 "
" 7	"	"	"	14	"	"	16 "
" 8	"	"	"	12	"	"	13 "

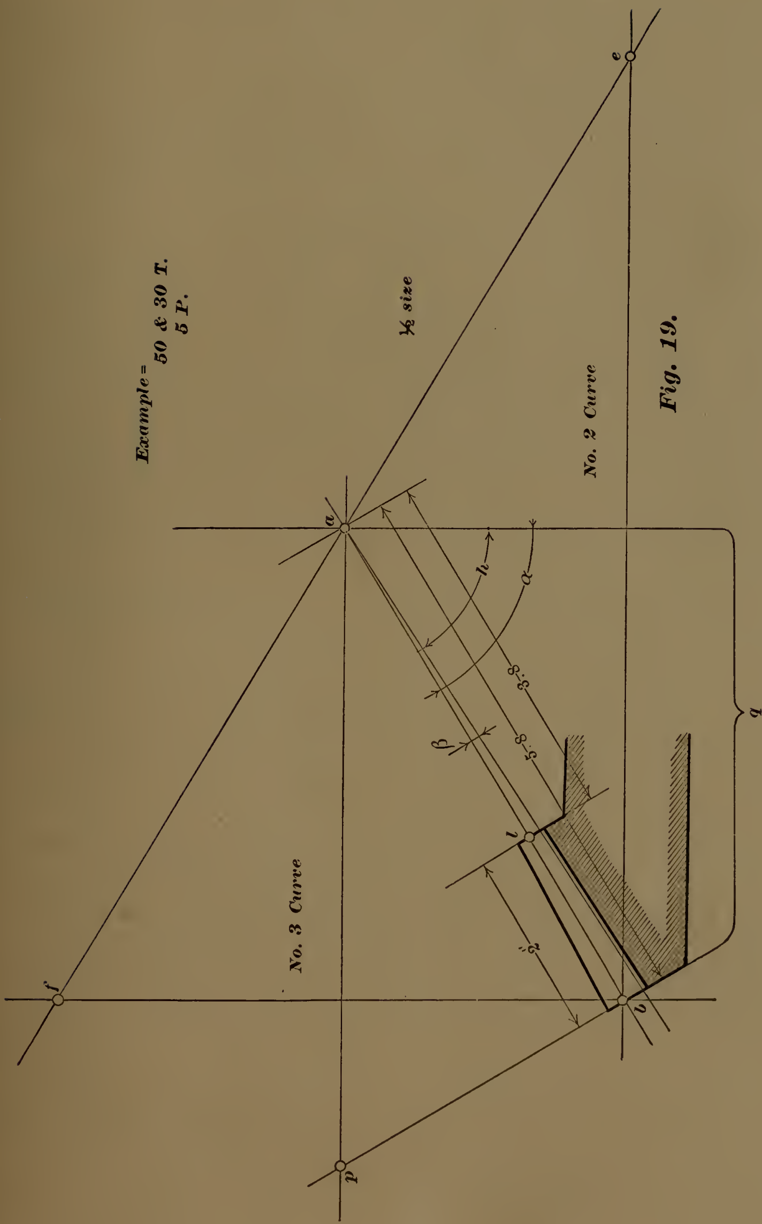


Fig. 19.

Part II.—Determine Thickness of Cutter.

It is very evident that a bevel gear cutter cannot be thicker than the width of the space at small end of tooth; the practice is to make cutter .005″ thinner. Theoretically the cutting angle (h) is equal to pitch angle less angle of bottom (or $h = \alpha - \beta'$). Practically, however, better results are obtained by making $h = \alpha - \beta$ (substituting angle of top for angle of bottom), and in calculating the depth at small end, to add the full clearance (f) to the obtained working depth, giving equal amount of clearance at large and small end. This is done to obtain a tooth thinner at the top and more curved. As the small end of tooth determines the thickness of cutter, we shall have to find the tooth part values at small end. From the diagram it will be seen that the values at large end are to those at small end as their respective apex distances ($a\ b$ and $a\ l$). The numerical values of these can be taken from the diagram and the quotient of the larger in the smaller is the constant wherewith to multiply the tooth values at large end, to obtain those at small end. In our example we find:

$$\frac{a\,l = 3.8}{a\,b = 5.8} = .655 = \text{constant}$$

For 5 P we have:

$$\begin{array}{rl|rl}
t = & .3141 & t' = & .2057 \\
s = & .2000 & s' = & .1310 \\
f = & .0314 & f = & \underline{.0314} \\
s + f = & .2314 & s' + f = & .1624 \\
D'' + f = & .4314. & s' = & \underline{.1310} \\
 & & D''' + f = & .2934
\end{array}$$

From the foregoing it is evident that a spur gear cutter could not be used, since a bevel gear cutter must be thinner.

If in gears of more than 30 teeth the faces are proportionately long, we select a cutter whose curve corresponds to the midway section of the tooth. The curve of the cutter is found by the method explained in Part I. of this Chapter.

PART III.—SELECTION OF CUTTERS.

The tables, pages 94 and 95, are convenient for selecting cutters for cutting bevel gears and are those used in furnishing cutters from stock. The various numbers of teeth in gear and pinion are given and at the intersection of the two columns will be found the numbers of cutter required.

EXAMPLE—Required cutters for a pair of bevel gears, 8 pitch; gear 24 teeth, pinion 12 teeth.

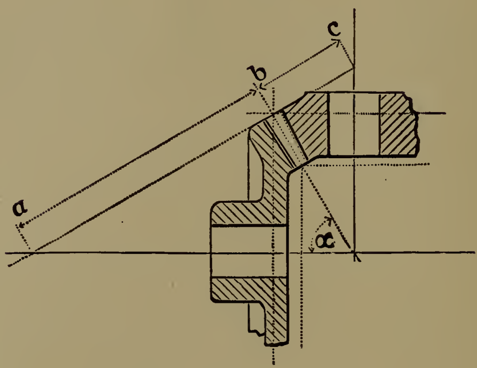
In column at left of table, page 94 will be found 24 teeth and in column at top 12 teeth; at the intersection of these two columns is found the number of the cutters, in this case No. 3 for the gear and No. 8 for the pinion.

Filing the teeth at the small end.

Different methods are employed to compromise in the cutting of a bevel gear. When a blank is rotated in adjusting to finish the large end of the teeth, there need not be much filing of the small end, if the cutter is right, for a given pitch circle, but the tooth faces may be rather thin at the large ends. This compromise is usually preferred, as it does not require much filing of the teeth; it is the same as given in the general catalogue issued by Brown & Sharpe Mfg. Co. and is used by them to fill any order for bevel gear cutters, unless the number of the cutter is specified in the order. This means that a customer would receive a No. 8, 8-pitch bevel gear cutter in reply to an order for a cutter to cut a 12-tooth pinion, ½″ face, while in their own gear cutting department the same pinion might be cut with a No. 6, 8-pitch cutter, because it is preferred to file the teeth at the small end after cutting them to the right thickness at the faces of the large end. No. 6 instead of a No. 8 would be taken only for a 12-tooth pinion that is to run with a gear two or three times as large. In the gear cutting department of Brown & Sharpe Mfg. Co. it is the general practice to step off to the next cutter for pinions fewer than 25 teeth, when the number for the teeth has a fraction nearly reaching the range of the next cutter: thus, if twice the back cone radius in inches, multiplied by the diametral pitch, equals 20.9, a No. 5 cutter should be used, which is for 21 to 25 teeth inclusive. In filling an order for a gear cutter, the fraction is not considered, but the cutter indicated by the whole number is sent.

Selection of cutter when teeth are to be filed.

PART IV.—SELECTING CUTTERS BY USE OF BACK CONE RADIUS.



Measure the back cone radius *a b* for the gear, or *b c* for the pinion. This is equal to the radius of a spur gear, the number of teeth in which would determine the cutter to use.

RULE.—Multiply the back cone radius by 2 and the product by the diametral pitch; the resulting product is the number of teeth for which to select the cutter.

EXAMPLE.—Let the back cone radius $a\ b = 4''$ and the diametral pitch = 8. $2 \times 4 = 8$, $8 \times 8 = 64$, the number of teeth for which the cutter should be selected, which in this case would be a No. 2 Cutter.

CHAPTER VIII.

THE INDEXING OF ANY WHOLE OR FRACTIONAL NUMBER. —DIFFERENTIAL INDEXING.

(Fig. 21)

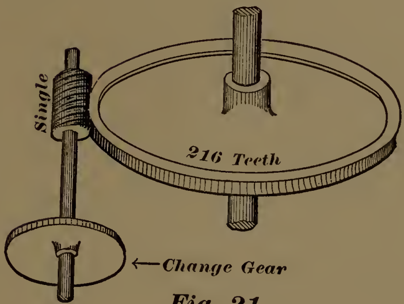


Fig. 21.

In indexing on a machine the question simply is: How many divisions of the machine index have to be advanced to advance a unit division of the number required. To which is the

$$\text{answer} = \frac{\text{divisions of machine index}}{\text{number to be indexed}}$$

Suppose the number of divisions in index wheel of machine to be 216.

EXAMPLE I.—Index 72.

Answer: $\frac{216}{72} = 3$ (3 turns of worm).

EXAMPLE II.—Index 123.

$$\frac{216}{123} = 1 + \frac{93}{123}$$

If now we should put on worm shaft a change gear having 123 teeth, give the worm shaft, Fig. 21, one turn, and in addition thereto advance 93 teeth of the change gear (to give the fractional turn), we would have indexed correctly one unit of the given number, and so solved the problem. Should we not have change gear 123 we may try those on hand. The question then is: How many teeth (χ) of the gear on hand (for instance 82) must we advance to obtain a result equal to the one when advancing 93 teeth of the 123 tooth gear? We have:

$$\frac{93}{123} = \frac{\chi}{82} \text{ where } \chi = 62$$

EXAMPLE III.—Index 365, change gear 147.

$$\frac{216}{365} = \frac{\chi}{147} \text{ where } \chi = 87 - \frac{3}{365}$$

Here 147 is the change gear on hand. In indexing for a unit of 365 we advance 87 teeth of our 147 tooth gear. It is evident that in so doing we advance too fast and will have indexed three teeth of our change gear too many when the circle is completed. To avoid having this error show in its total amount between the last and the first division, we can distribute the error by dropping one tooth at a time at three even intervals.

EXAMPLE IV.—Index 190.

$$\frac{216}{190} = 1 + \frac{26}{190} \qquad \text{Change gear on hand 88 T}$$

$$\frac{26}{190} = \frac{\chi}{88} \text{ where } \chi = 12 + \frac{8}{190}$$

To distribute the error in this case we advance one additional tooth ot a time of the change gear at eight even intervals.

EXAMPLE V.—Index 117.3913.

$$\frac{216}{117.3913} = 1 + \frac{986087}{1173913}$$

This example is in nowise different from the preceding ones, except that the fraction is expressed in large numbers. This fraction we can reduce to lower approximate values, which for practical purposes are accurate enough. This is done by the method of continued fractions. [For an explana-

tion of this method we refer to our "Practical Treatise on Gearing."]

$$\frac{986c87}{1173913}$$

```
986087) 1173913 (1
        986087
        187826) 986087 (5
                939130
                 46957) 187826 (3
                        140871
                         46955) 46957 (1
                                46955
                                    2) 46955 (23477
                                       46954
                                           1) 2 (2
                                              2
                                              0
```

$$\frac{986087}{1173913} = \cfrac{1}{1 + \cfrac{1}{5 + \cfrac{1}{3 + \cfrac{1}{1 + \cfrac{1}{23477 + \cfrac{1}{2}}}}}}$$

1	5	$c = 3$	1	23477	2
$a = 1$	$b = 5$	$d = 16$	21	493033	986087
$a^1 = 1$	$b^1 = 6$	$d^1 = 19$	25	586944	1173913

NOTE.—Find the first two fractions by reduction $\frac{1}{1} = \frac{1}{1}$ and $\cfrac{1}{1 + \cfrac{1}{5}} = \frac{5}{6}$; the others are then found by the rule $\begin{cases} b\,c + a = d \\ b^1\,c + a^1 = d^1 \end{cases}$

The fraction $\frac{21}{25}$ is a good approximation; putting therefore a change gear of 25 teeth on worm shaft, we advance (beside the one full turn) 21 teeth to index our unit.

Of course, in using any but the correct fraction we have an error every time we index a division; so that when indexed around the whole circle, we have multiplied this error by the number of divisions.

In the present example this error is evidently equal to the difference between the correct and the approximate fraction used. Reducing both common fractions to decimal fractions we have:

$$\frac{986087}{1173913} = .84000006$$

$$\frac{21}{25} = \frac{.84000000}{.00000006} = \text{error in each division.}$$

.00000006 × 117.3913 = .00000704348 total error in complete circle. This error is expressed in parts of a unit division. (To find this error expressed in inches, multiply it by the distance between two divisions, measured on the circle.) In this case the approximate fraction being smaller than the correct one, in indexing the whole circle we fall short .00000704348 of a division.

EXAMPLE VI.—Index 15.708

$$\frac{216}{15.708} = 13 + \frac{11796}{15708}$$

$$\frac{11796}{15708} = \frac{983}{1309}$$

```
983) 1309 (1
     983
     326) 983 (3
          978
            5) 326 (65
               30
                26
                25
                 1) 5 (5
                    5
                    0
```

$$\frac{983}{1309} = \cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{65+\cfrac{1}{5}}}}$$

1	3	65	5
$\frac{1}{1}$	$\frac{3}{4}$	$\frac{196}{261}$	$\frac{983}{1309}$

In using the approximation $\frac{196}{261}$ the error for each division (found as above) will be .000002927, for the whole circle .0000460. In this case, the approximation being larger than the correct fraction, we overreach the circle by the error.

DIFFERENTIAL INDEXING.

The gearing of the spiral head spindle of a Milling Machine to the index plate is equivalent to increasing the spacing numbers of the machine, as the rotation of the index plate modifies the movement of the index crank at each indexing.

When this modification is employed, the indexing is known as *Differential Indexing.*

Usually the regular spacing number of a Milling Machine is 40.

$V =$ number of turns of the index plate to one turn of the spindle $=$ the train of gears, either simple or compound geared.*

$N =$ number of divisions required.

$h =$ number of holes in index plate circle to be used.

$n =$ number of holes taken at each indexing.

Then $\frac{n}{h} =$ number of turns of the index crank at each indexing in relation to the index plate.

$40 - V =$ spacing number when the index plate rotates in the same direction as the crank, using one idler.

$40 + V =$ spacing number when the index plate rotates in the opposite direction to the crank, using two idlers.

When compound gearing is employed, the two gears on the gear stud act as one idler in relation to the direction that the index plate rotates.

$\frac{Nn}{h} =$ number of turns of the crank in N indexings, when plate is held stationary. In ordinary indexing $\frac{Nn}{h} = 40$.

In Differential Indexing, $\frac{Nn}{h}$ is increased or decreased by the rotation of the index plate while turning the index

*That is, $V =$ the product of the driving gears divided by the product of the driven gears. The gear on the spiral head spindle and the first gear on the stud are drivers; the second gear on the stud and the gear on the worm are driven.

crank. $\frac{n}{h}$ denotes in all cases the turns of the crank in relation to the index plate.

$V = 40 - \frac{Nn}{h}$, when using one idler and $\frac{Nn}{h}$ is less than 40.

$V = \frac{Nn}{h} - 40$, when using two idlers and $\frac{Nn}{h}$ is greater than 40.

$$N = \frac{40 - V}{\frac{n}{h}} \text{ or } N = (40 - V)\frac{h}{n}, \text{ using one idler.}$$

$$N = \frac{40 + V}{\frac{n}{h}} \text{ or } N = (40 + V)\frac{h}{n}, \text{ using two idlers.}$$

To figure a table of different divisions, N, it is convenient to assume various ratios, V, and find divisions obtainable from the spacing numbers $40 - V$ and $40 + V$. Assuming different values for $\frac{n}{h}$.

Assuming $V = 1$, $40 - V = 39$, one spacing number, employing one idler. With this, divisions can be obtained that are composed of any of the factors of 39 divided by $\frac{n}{h}$, or $39 \times \frac{h}{n}$.

EXAMPLES.—Spacing number 39.

$$n = 1, \ h = 5; \quad N = 39 \times \frac{5}{1} = 195.$$

$$n = 1, \ h = 7; \quad N = 39 \times \frac{7}{1} = 273.$$

$$n = 3, \ h = 17; \quad N = 39 \times \frac{17}{3} = 221$$

The other spacing number, when $V = 1$, is $40 + 1 = 41$. As 41 is prime, aliquot divisions can be obtained only by giving a value of 1 or 41 to n, when $\frac{n}{h}$ is in its lowest terms.

EXAMPLES.—Spacing number 41.

$$n = 1,\ h = 49.\quad N = 41 \times \frac{49}{1} = 2009.$$

$$n = 41,\ h = 17.\quad N = 41 \times \frac{17}{41} = 17.$$

FRACTIONAL SPACING NUMBERS.

If V is a fraction, the spacing number is fractional.

Assuming $V = \frac{2}{3}$, $40 - V = 39\frac{1}{3}$, one spacing number employing one idler. $39\frac{1}{3} = \frac{118}{3}$.

EXAMPLES.—Spacing number $39\frac{1}{3}$.

$$n = 1,\ h = 3;\quad N = \frac{118}{3} \times \frac{3}{1} = 118.$$

$$n = 2,\ h = 3;\quad N = \frac{118}{3} \times \frac{3}{2} = 59.$$

$$n = 2,\ h = 15;\quad N = \frac{118}{3} \times \frac{15}{2} = 295.$$

The other spacing number, when $V = \frac{2}{3}$, is $40 + \frac{2}{3} = 40\frac{2}{3} = \frac{122}{3}$, using two idlers.

EXAMPLES.—Spacing number $40\frac{2}{3}$.

$$n = 1,\ h = 3;\quad N = \frac{122}{3} \times \frac{3}{1} = 122.$$

$$n = 1,\ h = 33;\quad N = \frac{122}{3} \times \frac{33}{1} = 1342.$$

N given to find V; In this case $\frac{n}{h}$ must be assumed. The formula, $V = 40 - \frac{Nn}{h}$ or $V = \frac{Nn}{h} - 40$ can be used in solving for V. First find $\frac{n}{h}$ that will give a number of divisions approximating N; this assumed number is $\frac{40h}{n}$.

EXAMPLE 1.

$N = 59$. Required $\frac{n}{h}$ and V.

Try $\frac{n}{h}$ for 60 divisions $= \frac{40}{60} = \frac{2}{3}$. In this case $\frac{Nn}{h} = \frac{59 \times 2}{3} = 39\frac{1}{3}$, which is less than 40 and the formula $V = 40 - \frac{Nn}{h}$ is used.

$40 - \frac{59 \times 2}{3} = \frac{2}{3}$, therefore in 59 indexings the crank will still require $\frac{2}{3}$ of a turn to complete the 40 necessary for one revolution of the spindle: The train or $V = \frac{2}{3}$ and the gear on the spindle must have $\frac{2}{3}$ the number of teeth in the gear on the worm, using one idler.

EXAMPLE 2.

$N = 319$. Required $\frac{n}{h}$ and V.

Try $\frac{n}{h}$ for 290 divisions $= \frac{4}{29}$.

In this case $\frac{Nn}{h}$ is greater than 40 and using the formula $V = \frac{Nn}{h} - 40$.

$\frac{319 \times 4}{29} - 40 = 4$. $V = 4$ and the index plate must turn in the opposite direction to the crank.

When the ratio is not obtainable with simple gearing, it can sometimes be obtained with compound gearing.

$\frac{4}{1}$ can be expressed as follows: $\frac{3 \times 4}{1 \times 3}$ or $\frac{72 \times 64}{24 \times 48}$ for which there are available gears.

When the assumed number is less than N, the formulas $V = \frac{Nn}{h} - 40$ can also be expressed in the form:

$V = \frac{n}{h}(N - \frac{40h}{n})$ and when greater than N, $V = 40 - \frac{Nn}{h}$ can be expressed $V = \frac{n}{h}(\frac{40h}{n} - N)$.

These formulas indicate that the gear ratio, V, can be obtained by multiplying the indexing, $\frac{n}{h}$, by the difference between the assumed number, $\frac{40h}{n}$, and the required number, N.

Spacing for quarter degrees.

EXAMPLE 3.—Required $\frac{n}{h}$ and V for spacing $\frac{1}{4}$ degree or 1440 divisions.

Try $\frac{n}{h} = \frac{1}{33}$ and the assumed number is 1320.

$$V = \frac{n}{h}(N - \frac{40h}{n}) = \frac{1}{33}(1440 - 1320) = \frac{120}{33}.$$

$$V = \frac{120}{33} \text{ or } \frac{64 \times 100}{40 \times 44}.$$

Two idlers are required, one in addition to the gears on the compound gear stud.

ALIQUANT OR FRACTIONAL SPACING.

EXAMPLE.—Required a Vernier to read to $\frac{1}{12}$ degree or 5 minutes the scale being divided to degrees.

Each Vernier space can equal $\frac{11}{12}$ degree.

$\frac{11}{12} \times \frac{1}{360} = \frac{11}{4320}$ or $\frac{4320}{11}$ spaces in whole circle $= 392\frac{8}{11}$ spaces.

Assume $\frac{n}{h} = \frac{1}{9}$ or $\frac{40h}{n} = 360$.

$$V = \frac{1}{9}\left(392\frac{8}{11} - 360\right) = \frac{1}{9} \times \frac{360}{11} = \frac{40}{11} = \frac{64 \times 100}{40 \times 44}.$$

One idler in addition to the gears on the compound stud is necessary.

If h contains a factor that is not found in the gears, V cannot usually be obtained, unless the factor is cancelled by the difference between N and the assumed number or unless N contains the factor.

The index tables furnished with the Brown & Sharpe Universal Milling Machines give all divisions from 1 to 382. These divisions can all be obtained with the index change gears furnished with the machine. Divisions greater than 382 can be calculated and with additional gears the number of obtainable divisions greatly increased.

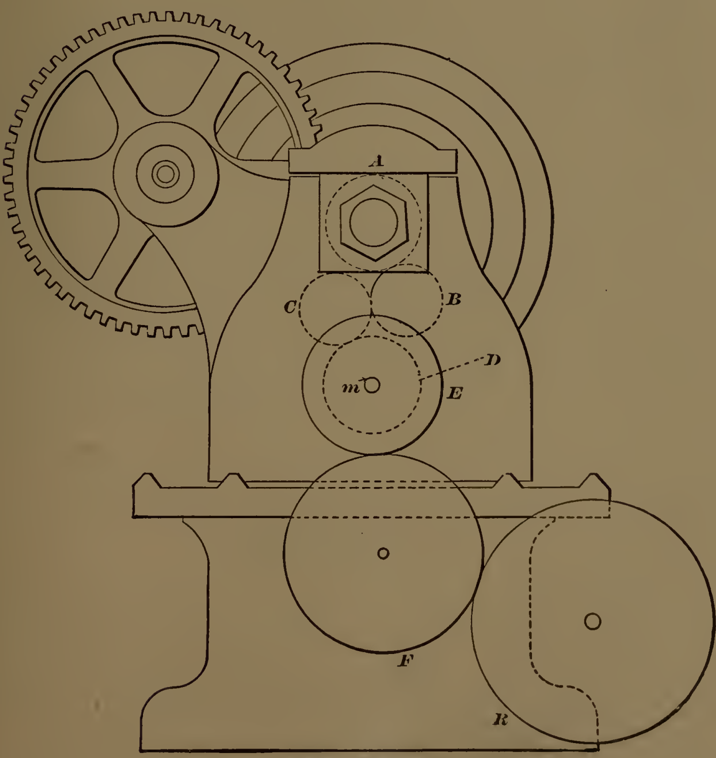
This method of indexing is covered by a patent controlled by Brown & Sharpe Mfg. Co.

CHAPTER IX.

THE GEARING OF LATHES FOR SCREW CUTTING.

(Figs. 22, 23.)

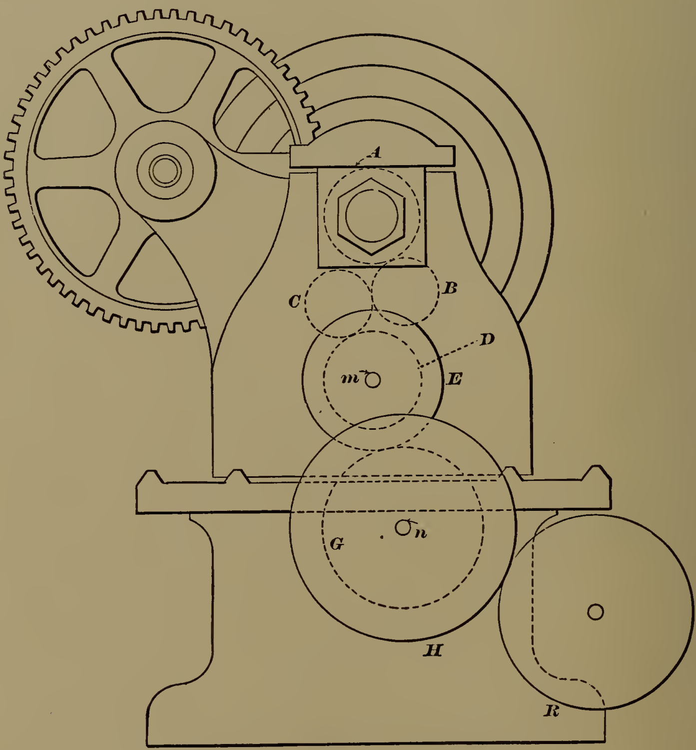
The problem of cutting a screw on a lathe resolves itself into connecting the lathe spindle with the lead screw by a train of gears in such a manner that the carriage (which is actuated by



Simple Gearing.
Fig. 22.

the lead screw) advances just one inch, or some definite distance, while the lathe spindle makes a number of revolutions equal to the number of threads to be cut per inch.

The lead screw has, with the exception of a very few cases, always a single thread, and to advance the carriage one inch it therefore makes a number of revolutions equal to its number



Compound Gearing.
Fig. 23.

of threads per inch. Should the lead screw have double thread, it will, to accomplish the same result, make a number of revolutions equal to half its number of threads per inch. It follows that we must know in the first place the number of threads per inch on lead screw.

It ought to be clearly understood that one or more intermediate gears, which simply transmit the motion received from one gear to another, in no wise alter the ultimate ratio of a train of gearing. An even number of intermediate gears simply change the direction of rotation, an odd number do not alter it.

The gearing of a lathe to solve a problem in screw cutting can be accomplished by

A. Simple gearing.
B. Compound gearing.

Referring to the diagrams, Figs. 22 and 23, we have in Fig. 22 a case of simple, and in Fig. 23 a case of compound gearing.

In simple gearing the motion from gear E is transmitted either directly to gear R on lead screw or through the intermediate F. In compound gearing the motion of E is transmitted through two gears (G and H) keyed together, revolving on the same stud *n*, by which we can change the velocity ratio of the motion while transmitting it from E to R. With these four variables E, G, H, R, we are enabled to have a wider range of changes than in simple gearing.

B and C, being intermediate gears, are not to be considered. If, as is generally the case, gear A equals gear D, we disregard them both, simply remembering that gear E (being fast on same shaft with D) makes as many revolutions as the spindle. Sometimes gear D is twice as large as gear A, then, still considering gear E as making as many revolutions as the spindle, we deal with the lead screw as having twice as many threads per inch as it measures.

SIMPLE GEARING.

Let there be: the number of teeth in the different gears expressed by their respective letters, as per Fig. 22, and

s = threads per inch to be cut,
L = threads per inch on lead screw; then

1. $$\frac{s}{L} = \frac{R}{E}$$

If now one of the two gears E and R is selected, the other will be :

$$R = \frac{s\,E}{L}\,; \quad E = \frac{L\,R}{s}$$

2. The two gears may be found by making

$$\left.\begin{array}{l} R = p\,s \\ E = p\,L \end{array}\right\} \text{where } p \text{ may be any number.}$$

3. The above holds good when a fractional thread is to be cut, but if the fraction is expressed in large numbers, as, for instance, $s = 2.833$ ($2\frac{833}{1000}$), we first reduce this fraction ($\frac{833}{1000}$) to lower approximate values by the process of continued fraction (see pages 49 and 50).

```
833) 1000 (1
     833
     167) 833 (4
          668
          165) 167 (1
               165
                 2) 165 (82
                    16
                     5
                     4
                     1) 2 (2
                        2
                        0
```

1	4	1	82	2
$\frac{1}{1}$	$\frac{4}{5}$	$\frac{5}{6}$	$\frac{414}{497}$	$\frac{833}{1000}$

$$\frac{5}{6} = .833 \text{ (nearly) and } s = 2\frac{5}{6}$$

If in this case $L = 4$, and we select $E = 48$, then, since

$$R = \frac{s\,E}{L} \quad R = 34$$

COMPOUND GEARING.

4. In a lathe geared compound for cutting a screw the product of the drivers (E and H, Fig. 23) multiplied by the number of threads per inch to be cut must equal the product of the driven (G and R) multiplied by the number of threads on lead screw. This is expressed by

$$E \,.\, H \,.\, s = G \,.\, R \,.\, L \text{ or } \frac{E \,.\, H \,.\, s}{G \,.\, R \,.\, L} = 1$$

If three of the gears E, H, G, R have been selected, the fourth one would be either

$$E = \frac{G\ R\ L}{H\ s} \quad \text{or}$$

$$H = \frac{G\ R\ L}{E\ s} \quad \text{or}$$

$$G = \frac{E\ H\ s}{R\ L} \quad \text{or}$$

$$R = \frac{E\ H\ s}{G\ L}$$

$$s = \frac{R\ G\ L}{E\ H} = L\left(\frac{R\ .\ G}{L\ .\ E\ .\ H}\right)$$

If a fractional thread is to be cut, as under "3," we reduce the fraction to lower approximate values.

EXAMPLE.—Gear for 5.2327 threads per inch, lead screw is 6 threads.

$$.2327 = \frac{2327}{10000}$$

```
2327) 10000 (4
       9308
        692) 2327 (3
             2076
              251) 692 (2
                   502
                   190) 251 (1
                        190
                         61) 190 (3
                             183
                               7) 61 (8
                                  56
                                   5) 7 (1
                                      5
                                      2) 5 (2
                                         4
                                         1) 2 (2
                                            2
                                            0
```

4	3	2	1	3	8	1	2	2
$\frac{1}{4}$	$\frac{3}{13}$	$\frac{7}{30}$	$\frac{10}{43}$	$\frac{37}{159}$	$\frac{306}{1315}$	$\frac{343}{1474}$	$\frac{992}{4263}$	$\frac{2327}{10000}$

$$\frac{10}{43} = .2327 \text{ (nearly) and } 5.2327 = 5\frac{10}{43}$$

Selecting E = 43, H = 52, R = 50, and

$$G = \frac{E\ .\ H\ .\ s}{R\ .\ L} \quad \text{we have } G = \frac{43\ .\ 52\ .\ 5\frac{10}{43}}{50\ .\ 6} = 39.$$

5. The examples so far given all deal with single thread. The pitch of a screw is the distance from center of one thread to the center of the next. The lead of a screw is the advance for each complete revolution. In a single thread screw the pitch is equal to the lead, while in a double thread screw the pitch is equal to one-half the lead; in a triple thread screw equal to one-third the lead, etc.

If we have to gear a lathe for a many-threaded screw (double, triple, quadruple, etc.), we simply ascertain the lead, and deal with the lead as we would with the pitch in a single thread screw, *i. e.*, we divide one inch by it, to obtain the number of threads for which we have to gear our lathe.

EXAMPLE.—Gear for double thread screw, lead = .4654. Number of threads per inch to be geared for is:

$$\frac{1}{\text{Lead}} = \frac{1}{.4654} = 2.1487$$

Lead screw is four threads per inch.

As in previous examples, we reduce the fraction $.1487 = \frac{1487}{10000}$ to lower approximate values by the process of continued fraction.

From the different values received in the usual way we select:

$$\frac{11}{74} = .1487 \text{ (nearly) and } 2.1487 = 2\tfrac{11}{74}$$

We have therefore:

$$s = 2\tfrac{11}{74}$$

$$L = 4$$

$$\text{Selecting} \begin{cases} E = 74 \\ G = 30 \\ H = 40 \end{cases}$$

$$R = \frac{E \cdot H \cdot s}{G \cdot L} = \frac{74 \cdot 40 \cdot 2\frac{11}{74}}{30 \cdot 4} = 53$$

NOTE.—In using any but the original fraction we commit an error. This error can be found by reducing the approximate fraction used to a decimal fraction, and comparing it with the original fraction. In the above example the original fraction is

$$\begin{array}{r} .1487 \text{ and} \\ \frac{11}{74} = .14864 \\ \hline \text{Error} = .00006 \text{ inch in lead.} \end{array}$$

In cutting a multiple screw, after having cut one thread, the question arises how to move the thread tool the correct amount for cutting the next thread.

In cutting double, triple, etc., threads, if in simple or compound gearing the number of teeth in gear E is divisible by 2, 3, etc., we so divide the teeth; then leaving the carriage at rest we bring gear E out of mesh and move it forward one division, whereby the spindle will assume the correct position.

When E is not divisible we find how many turns (V) of gear R are made to each full turn of the spindle. Dividing this number by 2 for double, by 3 for triple thread, etc., we advance R so many turns and fractions of a turn, being careful to leave the spindle at rest.

For compound gearing:

$$V = \frac{E \, . \, H}{G \, . \, R}$$

When the gear D is twice as large as the gear A (as explained in fifth paragraph, page 60.) the formula would be

$$V = \frac{E. \; H.}{2 \; G. \; R.}$$

If in simple gearing both E and R are not divisible, one remedy would be to gear the lathe compound; or the face-plate may be accurately divided in two, three or more slots, and all that is then necessary is to move the dog from one slot to another, the carriage remaining stationary.

Table of Tooth Parts

TABLE OF TOOTH PARTS.

CIRCULAR PITCH IN FIRST COLUMN.

Circular Pitch.	Threads or Teeth per inch Linear.	Diametral Pitch.	Thickness of Tooth on Pitch Line.	Addendum and Module.	Working Depth of Tooth.	Depth of Space below Pitch Line.	Whole Depth of Tooth.	Width of Thread-Tool at End.	Width of Thread at Top.
P'	$\frac{1''}{P'}$	P	t	s	D''	$s+f$	$D''+f$	$P' \times .31$	$P' \times .335$
2	$\frac{1}{2}$	1.5708	1.0000	.6366	1.2732	.7366	1.3732	.6200	.6700
$1\frac{7}{8}$	$\frac{8}{15}$	1.6755	.9375	.5968	1.1937	.6906	1.2874	.5813	.6281
$1\frac{3}{4}$	$\frac{4}{7}$	1.7952	.8750	.5570	1.1141	.6445	1.2016	.5425	.5863
$1\frac{5}{8}$	$\frac{8}{13}$	1.9333	.8125	.5173	1.0345	.5985	1.1158	.5038	.5444
$1\frac{1}{2}$	$\frac{2}{3}$	2.0944	.7500	.4775	.9549	.5525	1.0299	.4650	.5025
$1\frac{7}{16}$	$\frac{16}{23}$	2.1855	.7187	.4576	.9151	.5294	.9870	.4456	.4816
$1\frac{3}{8}$	$\frac{8}{11}$	2.2848	.6875	.4377	.8754	.5064	.9441	.4262	.4606
$1\frac{1}{3}$	$\frac{3}{4}$	2.3562	.6666	.4244	.8488	.4910	.9154	.4133	.4466
$1\frac{5}{16}$	$\frac{16}{21}$	2.3936	.6562	.4178	.8356	.4834	.9012	.4069	.4397
$1\frac{1}{4}$	$\frac{4}{5}$	2.5133	.6250	.3979	.7958	.4604	.8583	.3875	.4188
$1\frac{3}{16}$	$\frac{16}{19}$	2.6456	.5937	.3780	.7560	.4374	.8156	.3681	.3978
$1\frac{1}{8}$	$\frac{8}{9}$	2.7925	.5625	.3581	.7162	.4143	.7724	.3488	.3769
$1\frac{1}{16}$	$\frac{16}{17}$	2.9568	.5312	.3382	.6764	.3913	.7295	.3294	.3559
1	1	3.1416	.5000	.3183	.6366	.3683	.6866	.3100	.3350
$\frac{15}{16}$	$1\frac{1}{15}$	3.3510	.4687	.2984	.5968	.3453	.6437	.2906	.3141
$\frac{7}{8}$	$1\frac{1}{7}$	3.5904	.4375	.2785	.5570	.3223	.6007	.2713	.2931
$\frac{13}{16}$	$1\frac{3}{13}$	3.8666	.4062	.2586	.5173	.2993	.5579	.2519	.2722
$\frac{4}{5}$	$1\frac{1}{4}$	3.9270	.4000	.2546	.5092	.2946	.5492	.2480	.2680
$\frac{3}{4}$	$1\frac{1}{3}$	4.1888	.3750	.2387	.4775	.2762	.5150	.2325	.2513
$\frac{11}{16}$	$1\frac{5}{11}$	4.5696	.3437	.2189	.4377	.2532	.4720	.2131	.2303
$\frac{2}{3}$	$1\frac{1}{2}$	4.7124	.3333	.2122	.4244	.2455	.4577	.2066	.2233
$\frac{5}{8}$	$1\frac{3}{5}$	5.0265	.3125	.1989	.3979	.2301	.4291	.1938	.2094
$\frac{3}{5}$	$1\frac{2}{3}$	5.2360	.3000	.1910	.3820	.2210	.4120	.1860	.2010
$\frac{4}{7}$	$1\frac{3}{4}$	5.4978	.2857	.1819	.3638	.2105	.3923	.1771	.1914
$\frac{9}{16}$	$1\frac{7}{9}$	5.5851	.2812	.1790	.3581	.2071	.3862	.1744	.1884

TABLE OF TOOTH PARTS.—*Continued.*

CIRCULAR PITCH IN FIRST COLUMN.

Circular Pitch.	Threads or Teeth per inch Linear.	Diametral Pitch.	Thickness of Tooth on Pitch Line.	Addendum and Module.	Working Depth of Tooth.	Depth of Space below Pitch Line.	Whole Depth of Tooth.	Width of Thread-Tool at End.	Width of Thread at Top.
P'	$\frac{1''}{P'}$	P	t	s	D''	$s+f$	$D''+f.$	$P'\times.31$	$P'\times.335$
$\frac{1}{2}$	2	6.2832	.2500	.1592	.3183	.1842	.3433	.1550	.1675
$\frac{4}{9}$	$2\frac{1}{4}$	7.0685	.2222	.1415	.2830	.1637	.3052	.1378	.1489
$\frac{7}{16}$	$2\frac{2}{7}$	7.1808	.2187	.1393	.2785	.1611	.3003	.1356	.1466
$\frac{3}{7}$	$2\frac{1}{3}$	7.3304	.2143	.1364	.2728	.1578	.2942	.1328	.1436
$\frac{2}{5}$	$2\frac{1}{2}$	7.8540	.2000	.1273	.2546	.1473	.2746	.1240	.1340
$\frac{3}{8}$	$2\frac{2}{3}$	8.3776	.1875	.1194	.2387	.1381	.2575	.1163	.1256
$\frac{4}{11}$	$2\frac{3}{4}$	8.6394	.1818	.1158	.2316	.1340	.2498	.1127	.1218
$\frac{1}{3}$	3	9.4248	.1666	.1061	.2122	.1228	.2289	.1033	.1117
$\frac{5}{16}$	$3\frac{1}{5}$	10.0531	.1562	.0995	.1989	.1151	.2146	.0969	.1047
$\frac{3}{10}$	$3\frac{1}{3}$	10.4719	.1500	.0955	.1910	.1105	.2060	.0930	.1005
$\frac{2}{7}$	$3\frac{1}{2}$	10.9956	.1429	.0909	.1819	.1052	.1962	.0886	.0957
$\frac{1}{4}$	4	12.5664	.1250	.0796	.1591	.0921	.1716	.0775	.0838
$\frac{2}{9}$	$4\frac{1}{2}$	14.1372	.1111	.0707	.1415	.0818	.1526	.0689	.0744
$\frac{1}{5}$	5	15.7080	.1000	.0637	.1273	.0737	.1373	.0620	.0670
$\frac{3}{16}$	$5\frac{1}{3}$	16.7552	.0937	.0597	.1194	.0690	.1287	.0581	.0628
$\frac{2}{11}$	$5\frac{1}{2}$	17.2788	.0909	.0579	.1158	.0670	.1249	.0564	.0609
$\frac{1}{6}$	6	18.8496	.0833	.0531	.1061	.0614	.1144	.0517	.0558
$\frac{2}{13}$	$6\frac{1}{2}$	20.4203	.0769	.0489	.0978	.0566	.1055	.0477	.0515
$\frac{1}{7}$	7	21.9911	.0714	.0455	.0910	.0526	.0981	.0443	.0479
$\frac{2}{15}$	$7\frac{1}{2}$	23.5619	.0666	.0425	.0850	.0492	.0917	.0414	.0446
$\frac{1}{8}$	8	25.1327	.0625	.0398	.0796	.0460	.0858	.0388	.0419
$\frac{1}{9}$	9	28.2743	.0555	.0354	.0707	.0409	.0763	.0344	.0372
$\frac{1}{10}$	10	31.4159	.0500	.0318	.0637	.0368	.0687	.0310	.0335
$\frac{1}{16}$	16	50.2655	.0312	.0199	.0398	.0230	.0429	.0194	.0209
$\frac{1}{20}$	20	62.8318	.0250	.0159	.0318	.0184	.0343	.0155	.0167

TABLE OF TOOTH PARTS.

DIAMETRAL PITCH IN FIRST COLUMN.

Diametral Pitch.	Circular Pitch.	Thickness of Tooth on Pitch Line.	Addendum and Module.	Working Depth of Tooth.	Depth of Space below Pitch Line.	Whole Depth of Tooth.
P	P′	*t*	*s*	D″	*s*+*f*.	D″+*f*.
½	6.2832	3.1416	2.0000	4.0000	2.3142	4.3142
¾	4.1888	2.0944	1.3333	2.6666	1.5428	2.8761
1	3.1416	1.5708	1.0000	2.0000	1.1571	2.1571
1¼	2.5133	1.2566	.8000	1.6000	.9257	1.7257
1½	2.0944	1.0472	.6666	1.3333	.7714	1.4381
1¾	1.7952	.8976	.5714	1.1429	.6612	1.2326
2	1.5708	.7854	.5000	1.0000	.5785	1.0785
2¼	1.3963	.6981	.4444	.8888	.5143	.9587
2½	1.2566	.6283	.4000	.8000	.4628	.8628
2¾	1.1424	.5712	.3636	.7273	.4208	.7844
3	1.0472	.5236	.3333	.6666	.3857	.7190
3½	.8976	.4488	.2857	.5714	.3306	.6163
4	.7854	.3927	.2500	.5000	.2893	.5393
5	.6283	.3142	.2000	.4000	.2314	.4314
6	.5236	.2618	.1666	.3333	.1928	.3595
7	.4488	.2244	.1429	.2857	.1653	.3081
8	.3927	.1963	.1250	.2500	.1446	.2696
9	.3491	.1745	.1111	.2222	.1286	.2397
10	.3142	.1571	.1000	.2000	.1157	.2157
11	.2856	.1428	.0909	.1818	.1052	.1961
12	.2618	.1309	.0833	.1666	.0964	.1798
13	.2417	.1208	.0769	.1538	.0890	.1659
14	.2244	.1122	.0714	.1429	.0826	.1541

TABLE OF TOOTH PARTS—*Continued.*

DIAMETRAL PITCH IN FIRST COLUMN.

Diametral Pitch.	Circular Pitch.	Thickness of Tooth on Pitch Line.	Addendum and Module.	Working Depth of Tooth.	Depth of Space below Pitch Line.	Whole Depth of Tooth.
P.	P′.	*t.*	*s.*	D″.	*s*+*f.*	D″+*f.*
15	.2094	.1047	.0666	.1333	.0771	.1438
16	.1963	.0982	.0625	.1250	.0723	.1348
17	.1848	.0924	.0588	.1176	.0681	.1269
18	.1745	.0873	.0555	.1111	.0643	.1198
19	.1653	.0827	.0526	.1053	.0609	.1135
20	.1571	.0785	.0500	.1000	.0579	.1079
22	.1428	.0714	.0455	.0909	.0526	.0980
24	.1309	.0654	.0417	.0833	.0482	.0898
26	.1208	.0604	.0385	.0769	.0445	.0829
28	.1122	.0561	.0357	.0714	.0413	.0770
30	.1047	.0524	.0333	.0666	.0386	.0719
32	.0982	.0491	.0312	.0625	.0362	.0674
34	.0924	.0462	.0294	.0588	.0340	.0634
36	.0873	.0436	.0278	.0555	.0321	.0599
38	.0827	.0413	.0263	.0526	.0304	.0568
40	.0785	.0393	.0250	.0500	.0289	.0539
42	.0748	.0374	.0238	.0476	.0275	.0514
44	.0714	.0357	.0227	.0455	.0263	.0490
46	.0683	.0341	.0217	.0435	.0252	.0469
48	.0654	.0327	.0208	.0417	.0241	.0449
50	.0628	.0314	.0200	.0400	.0231	.0431
56	.0561	.0280	.0178	.0357	.0207	.0385
60	.0524	.0262	.0166	.0333	.0193	.0360

Tables Giving Corrected T and Corrected S

TABLES GIVING CORRECTED T AND CORRECTED S FOR GEAR TEETH

To obtain corrected S and corrected T for any diametral pitch divide the corresponding dimension for 1 diametral pitch by the required diametral pitch.

EXAMPLE—Find the corrected S and T for a gear 5 diametral pitch 23 T.

1.5696÷5=.3139 Corrected T

1.0268÷5=.2054 " S

1 DIAMETRAL PITCH			
No. of Teeth.	No. of Cutter.	Corrected T	Corrected S
8			
9			
10			
11			
12	8	1.5663	1.0514
13	7½	1.5670	1.0474
14	7	1.5675	1.0440
15	6½	1.5679	1.0411
17	6	1.5686	1.0362
19	5½	1.5690	1.0324
21	5	1.5694	1.0294
23	4½	1.5696	1.0268
26	4	1.5698	1.0237
30	3½	1.5701	1.0208
35	3	1.5702	1.0176
42	2½	1.5704	1.0147
55	2	1.5706	1.0112
80	1½	1.5707	1.0077
135	1	1.5708	1.0046

For table giving circular pitch see following page.

To obtain corrected S and corrected T for any circular pitch, multiply the corresponding dimension for 1 circular pitch by the required circular pitch.

EXAMPLE—Find the corrected S and T for a ¾″ circular pitch gear with 15 teeth.

$.4991 \times \frac{3}{4} = .3743$ Corrected T
$.3314 \times \frac{3}{4} = .2486$ " S

1 CIRCULAR PITCH			
No. of Teeth	No. of Cutter	Corrected T	Corrected S.
8			
9			
10			
11			
12	8	.4986	.3347
13	7½	.4988	.3334
14	7	.4990	.3323
15	6½	.4991	.3314
17	6	.4993	.3298
19	5½	.4995	.3286
21	5	.4996	.3277
23	4½	.4997	.3268
26	4	.4997	.3258
30	3½	.4998	.3249
35	3	.4998	.3239
42	2½	.4999	.3230
55	2	.5000	.3219
80	1½	.5000	.3208
135	1	.5000	.3198

Table Giving Diameter Increments

DIAMETER INCREMENT.

DIAMETER INCREMENT-GEAR

PINION	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12
12	84 1.82	.87 1.80	.89 1.79	.93 1.77	.96 1.76	.99 1.74	1.03 1.71	1.07 1.69	1.11 1.66	1.15 1.63	1.20 1.60	1.25 1.56	1.30 1.52	1.36 1.47	1.41 1.41
13	.89 1.79	.92 1.77	.95 1.76	.98 1.74	1.02 1.72	1.05 1.70	1.09 1.68	1.13 1.65	1.17 1.62	1.21 1.59	1.26 1.55	1.31 1.51	1.36 1.47	1.41 1.41	
14	.95 1.76	.98 1.75	1.01 1.73	1.04 1.71	1.07 1.69	1.11 1.66	1.15 1.64	1.19 1.61	1.23 1.58	1.27 1.54	1.32 1.50	1.36 1.46	1.41 1.41		
15	1.00 1.73	1.03 1.71	1.06 1.70	1.09 1.68	1.13 1.65	1.16 1.63	1.20 1.60	1.24 1.57	1.28 1.54	1.32 1.50	1.37 1.46	1.41 1.41			
16	1.05 1.70	1.08 1.68	1.11 1.66	1.14 1.64	1.18 1.62	1.21 1.59	1.25 1.56	1.29 1.53	1.33 1.49	1.37 1.46	1.41 1.41				
17	1.09 1.67	1.12 1.65	1.16 1.63	1.19 1.61	1.22 1.58	1.26 1.55	1.30 1.52	1.33 1.49	1.37 1.45	1.41 1.41					
18	1.14 1.64	1.17 1.62	1.20 1.60	1.23 1.57	1.27 1.55	1.30 1.52	1.34 1.49	1.38 1.45	1.41 1.41						
19	1.18 1.61	1.21 1.59	1.24 1.57	1.27 1.54	1.31 1.51	1.34 1.48	1.38 1.45	1.41 1.41							
20	1.22 1.59	1.25 1.56	1.28 1.54	1.31 1.51	1.35 1.48	1.38 1.45	1.41 1.41								
21	1.26 1.56	1.29 1.53	1.32 1.50	1.35 1.48	1.38 1.45	1.41 1.41									
22	1.29 1.53	1.32 1.50	1.35 1.47	1.38 1.45	1.41 1.41										
23	1.33 1.50	1.35 1.47	1.38 1.44	1.41 1.41											
24	1.36 1.47	1.39 1.44	1.41 1.41												
25	1.39 1.44	1.41 1.41													
26	1.41 1.41														

For bevel gears with axes at right angles only.

DIAMETER INCREMENT—(*Continued.*)

DIAMETER INCREMENT-GEAR

PINION	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27
12	.56 1.92	.58 1.92	.59 1.91	.61 1.91	.63 1.90	.63 1.90	.65 1.89	.67 1.88	.68 1.88	.70 1.87	.72 1.87	.74 1.86	.76 1.85	.79 1.84	.81 1.83
13	.60 1.91	.61 1.90	.63 1.90	.65 1.89	.66 1.89	.68 1.88	.70 1.87	.71 1.87	.73 1.86	.75 1.85	.77 1.84	.80 1.83	.82 1.82	.84 1.81	.87 1.80
14	.65 1.89	.66 1.89	.67 1.88	.69 1.88	.71 1.87	.72 1.86	.74 1.86	.76 1.85	.78 1.84	.80 1.83	.82 1.82	.85 1.81	.87 1.80	.89 1.79	.92 1.78
15	.69 1.88	.70 1.87	.72 1.87	.74 1.86	.75 1.85	.77 1.85	.79 1.84	.81 1.83	.83 1.82	.85 1.81	.87 1.80	.89 1.79	.92 1.78	.94 1.76	.97 1.75
16	.73 1.86	.74 1.86	.76 1.85	.77 1.85	.79 1.84	.81 1.83	.83 1.82	.85 1.81	.88 1.80	.89 1.79	.91 1.77	.94 1.75	.97 1.75	.99 1.74	1.02 1.72
17	.77 1.85	.78 1.84	.79 1.83	.81 1.83	.83 1.82	.86 1.81	.88 1.80	.89 1.79	.91 1.77	.94 1.76	.96 1.75	.99 1.74	1.01 1.73	1.04 1.71	1.07 1.69
18	.80 1.83	.82 1.82	.84 1.81	.86 1.81	.88 1.80	.89 1.79	.91 1.78	.93 1.77	.94 1.76	.98 1.74	1.01 1.73	1.03 1.72	1.06 1.70	1.08 1.68	1.11 1.66
19	.84 1.81	.86 1.81	.88 1.80	.89 1.79	.91 1.78	.93 1.77	.95 1.76	.97 1.75	.99 1.73	1.02 1.72	1.04 1.70	1.07 1.69	1.10 1.67	1.12 1.66	1.15 1.64
20	.88 1.80	.89 1.79	.91 1.78	.93 1.77	.95 1.76	.97 1.75	.99 1.74	1.01 1.72	1.04 1.71	1.06 1.70	1.08 1.68	1.11 1.66	1.14 1.64	1.16 1.63	1.19 1.61
21	.91 1.78	.93 1.77	.94 1.76	.97 1.75	.99 1.74	1.01 1.73	1.03 1.72	1.05 1.70	1.07 1.69	1.10 1.67	1.12 1.65	1.14 1.64	1.17 1.62	1.20 1.60	1.23 1.58
22	.95 1.76	.96 1.75	.98 1.74	1.00 1.73	1.02 1.72	1.04 1.71	1.06 1.69	1.09 1.68	1.11 1.66	1.13 1.65	1.16 1.63	1.18 1.61	1.21 1.59	1.24 1.57	1.26 1.55
23	.98 1.74	1.00 1.73	1.01 1.72	1.04 1.71	1.06 1.70	1.08 1.68	1.10 1.67	1.12 1.66	1.14 1.64	1.17 1.62	1.19 1.61	1.21 1.59	1.24 1.57	1.27 1.55	1.30 1.52
24	1.01 1.72	1.03 1.71	1.05 1.70	1.07 1.69	1.08 1.68	1.11 1.66	1.13 1.65	1.15 1.63	1.17 1.62	1.20 1.60	1.23 1.58	1.25 1.56	1.28 1.54	1.30 1.52	1.33 1.49
25	1.04 1.71	1.06 1.70	1.08 1.68	1.10 1.67	1.12 1.65	1.14 1.64	1.16 1.63	1.18 1.61	1.20 1.59	1.23 1.58	1.26 1.56	1.28 1.54	1.31 1.52	1.33 1.49	1.36 1.47
26	1.07 1.69	1.09 1.68	1.11 1.66	1.13 1.65	1.15 1.64	1.17 1.62	1.19 1.61	1.21 1.59	1.24 1.57	1.26 1.55	1.28 1.53	1.31 1.51	1.34 1.49	1.36 1.47	1.39 1.44
27	1.10 1.67	1.12 1.66	1.14 1.64	1.15 1.63	1.18 1.62	1.20 1.60	1.22 1.58	1.24 1.57	1.27 1.54	1.29 1.53	1.31 1.51	1.34 1.49	1.36 1.46	1.39 1.44	1.41 1.41
28	1.13 1.65	1.14 1.64	1.16 1.62	1.19 1.61	1.21 1.59	1.23 1.58	1.25 1.56	1.27 1.54	1.29 1.53	1.32 1.51	1.34 1.48	1.36 1.46	1.39 1.44	1.41 1.41	
29	1.15 1.63	1.17 1.62	1.19 1.60	1.21 1.59	1.23 1.57	1.26 1.56	1.28 1.54	1.30 1.52	1.32 1.50	1.34 1.48	1.37 1.46	1.39 1.44	1.41 1.41		
30	1.18 1.61	1.20 1.60	1.22 1.59	1.24 1.57	1.26 1.55	1.28 1.54	1.30 1.52	1.32 1.50	1.35 1.48	1.37 1.46	1.39 1.44	1.41 1.41			
31	1.21 1.59	1.23 1.58	1.25 1.57	1.26 1.55	1.28 1.53	1.31 1.51	1.33 1.50	1.35 1.48	1.37 1.46	1.39 1.44	1.41 1.41				
32	1.23 1.58	1.25 1.56	1.27 1.54	1.29 1.53	1.31 1.51	1.33 1.50	1.35 1.48	1.37 1.46	1.39 1.44	1.41 1.41					
33	1.25 1.56	1.27 1.54	1.29 1.53	1.31 1.51	1.33 1.49	1.35 1.48	1.37 1.45	1.39 1.43	1.41 1.41						
34	1.28 1.54	1.30 1.52	1.31 1.51	1.33 1.49	1.35 1.48	1.37 1.45	1.39 1.43	1.41 1.41							
35	1.30 1.52	1.32 1.50	1.34 1.49	1.35 1.48	1.38 1.45	1.39 1.43	1.41 1.41								
36	1.32 1.50	1.34 1.49	1.36 1.47	1.38 1.45	1.40 1.43	1.41 1.41									
37	1.34 1.49	1.36 1.47	1.38 1.45	1.40 1.43	1.41 1.41										
38	1.36 1.47	1.38 1.45	1.40 1.43	1.41 1.41											
39	1.38 1.45	1.40 1.43	1.41 1.41												
40	1.40 1.43	1.41 1.41													
41	1.41 1.41														

For bevel gears with axes at right angles only.

DIAMETER INCREMENT—(*Continued.*)

DIAMETER INCREMENT-GEAR

PINION	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42
12	.42 1.96	.43 1.95	.43 1.95	.44 1.95	.45 1.95	.46 1.95	.47 1.94	.48 1.94	.48 1.94	.49 1.94	.50 1.94	.52 1.93	.53 1.93	.54 1.93	.55 1.92
13	.45 1.95	.46 1.95	.47 1.94	.48 1.94	.48 1.94	.49 1.94	.50 1.94	.51 1.93	.52 1.93	.53 1.93	.54 1.92	.56 1.92	.57 1.92	.58 1.91	.59 1.91
14	.48 1.94	.49 1.94	.50 1.94	.51 1.93	.52 1.93	.53 1.93	.54 1.93	.55 1.92	.56 1.92	.57 1.92	.58 1.91	.59 1.91	.61 1.91	.62 1.90	.63 1.90
15	.52 1.93	.53 1.93	.54 1.93	.54 1.92	.55 1.92	.56 1.92	.57 1.92	.59 1.91	.60 1.91	.61 1.91	.62 1.90	.63 1.90	.65 1.89	.66 1.89	.67 1.88
16	.55 1.92	.56 1.92	.57 1.92	.58 1.91	.59 1.91	.60 1.91	.61 1.90	.62 1.90	.63 1.90	.64 1.89	.66 1.89	.67 1.88	.68 1.88	.70 1.87	.71 1.87
17	.58 1.91	.59 1.91	.60 1.91	.61 1.90	.62 1.90	.63 1.90	.64 1.89	.66 1.89	.67 1.89	.68 1.88	.69 1.88	.71 1.87	.72 1.87	.74 1.86	.75 1.85
18	.61 1.90	.62 1.90	.63 1.90	.64 1.89	.65 1.89	.67 1.89	.68 1.88	.69 1.88	.70 1.87	.72 1.87	.73 1.86	.74 1.86	.76 1.85	.77 1.84	.79 1.84
19	.64 1.89	.65 1.89	.66 1.89	.67 1.88	.69 1.88	.70 1.87	.71 1.87	.72 1.86	.74 1.86	.75 1.85	.76 1.85	.78 1.84	.79 1.84	.81 1.83	.82 1.82
20	.67 1.88	.68 1.88	.69 1.88	.71 1.87	.72 1.87	.73 1.86	.74 1.86	.76 1.85	.77 1.85	.78 1.84	.80 1.83	.81 1.83	.83 1.82	.84 1.81	.86 1.81
21	.70 1.87	.71 1.87	.72 1.86	.74 1.86	.75 1.85	.76 1.85	.77 1.84	.79 1.84	.80 1.83	.82 1.83	.83 1.82	.85 1.81	.86 1.80	.88 1.80	.89 1.79
22	.73 1.86	.74 1.86	.75 1.85	.77 1.85	.78 1.84	.79 1.84	.81 1.83	.82 1.82	.83 1.82	.85 1.81	.86 1.80	.88 1.80	.89 1.79	.91 1.78	.93 1.77
23	.76 1.85	.77 1.85	.78 1.84	.80 1.83	.81 1.83	.82 1.82	.84 1.82	.85 1.81	.86 1.80	.88 1.80	.89 1.79	.91 1.78	.93 1.77	.94 1.76	.96 1.75
24	.79 1.84	.80 1.83	.81 1.83	.83 1.82	.84 1.82	.85 1.81	.87 1.80	.88 1.80	.89 1.79	.91 1.78	.93 1.77	.94 1.76	.96 1.76	.97 1.75	.99 1.74
25	.82 1.83	.83 1.82	.84 1.81	.85 1.81	.87 1.80	.88 1.80	.89 1.79	.91 1.78	.92 1.77	.94 1.77	.95 1.76	.97 1.75	.99 1.74	1.01 1.73	1.02 1.72
26	.84 1.81	.85 1.81	.87 1.80	.88 1.80	.89 1.79	.91 1.78	.92 1.77	.94 1.77	.95 1.75	.97 1.75	.98 1.74	1.00 1.73	1.02 1.72	1.04 1.71	1.05 1.70
27	.87 1.80	.88 1.80	.89 1.79	.91 1.78	.92 1.78	.94 1.77	.95 1.76	.97 1.75	.98 1.74	1.00 1.73	1.01 1.72	1.03 1.71	1.05 1.70	1.06 1.69	1.08 1.68
28	.89 1.79	.91 1.78	.92 1.78	.93 1.77	.95 1.76	.96 1.75	.98 1.75	.99 1.74	1.01 1.73	1.02 1.72	1.04 1.71	1.06 1.70	1.07 1.69	1.09 1.68	1.11 1.66
29	.92 1.78	.93 1.77	.95 1.76	.96 1.75	.97 1.75	.99 1.74	1.00 1.73	1.02 1.72	1.03 1.71	1.05 1.70	1.07 1.69	1.08 1.68	1.10 1.67	1.12 1.66	1.14 1.65
30	.94 1.76	.96 1.76	.98 1.74	.99 1.74	1.00 1.73	1.01 1.72	1.03 1.71	1.04 1.71	1.06 1.70	1.08 1.69	1.09 1.68	1.11 1.66	1.13 1.65	1.14 1.64	1.16 1.63
31	.97 1.75	.98 1.74	1.00 1.73	1.01 1.73	1.02 1.72	1.04 1.71	1.05 1.70	1.07 1.69	1.09 1.68	1.10 1.67	1.12 1.66	1.13 1.65	1.15 1.63	1.17 1.62	1.19 1.61
32	.99 1.74	1.01 1.73	1.02 1.72	1.03 1.71	1.04 1.71	1.06 1.69	1.08 1.68	1.09 1.67	1.11 1.66	1.13 1.65	1.14 1.64	1.16 1.63	1.18 1.62	1.19 1.60	1.21 1.59
33	1.02 1.72	1.03 1.71	1.04 1.71	1.06 1.70	1.08 1.69	1.09 1.68	1.10 1.67	1.12 1.66	1.13 1.65	1.15 1.64	1.17 1.63	1.18 1.61	1.20 1.60	1.22 1.59	1.24 1.57
34	1.04 1.71	1.05 1.70	1.07 1.69	1.08 1.68	1.09 1.67	1.11 1.66	1.12 1.65	1.14 1.64	1.16 1.63	1.17 1.62	1.19 1.61	1.21 1.59	1.22 1.58	1.24 1.57	1.26 1.55
35	1.06 1.70	1.07 1.69	1.09 1.68	1.10 1.67	1.12 1.66	1.13 1.65	1.15 1.64	1.17 1.63	1.18 1.62	1.19 1.60	1.21 1.59	1.23 1.58	1.25 1.57	1.26 1.55	1.28 1.54
36	1.08 1.68	1.10 1.67	1.11 1.66	1.12 1.65	1.14 1.64	1.15 1.63	1.17 1.62	1.18 1.61	1.19 1.60	1.21 1.59	1.23 1.57	1.25 1.56	1.27 1.55	1.28 1.53	1.30 1.52
37	1.10 1.67	1.12 1.66	1.13 1.65	1.14 1.64	1.16 1.63	1.17 1.62	1.19 1.61	1.21 1.60	1.22 1.58	1.24 1.57	1.25 1.56	1.27 1.55	1.29 1.53	1.30 1.52	1.32 1.50
38	1.12 1.66	1.14 1.65	1.15 1.64	1.16 1.63	1.18 1.61	1.20 1.60	1.21 1.59	1.23 1.58	1.24 1.57	1.26 1.56	1.27 1.54	1.29 1.53	1.31 1.51	1.32 1.50	1.34 1.48
39	1.14 1.64	1.16 1.63	1.17 1.62	1.19 1.61	1.20 1.60	1.21 1.59	1.23 1.58	1.25 1.56	1.26 1.55	1.28 1.54	1.29 1.53	1.31 1.51	1.33 1.50	1.34 1.48	1.36 1.47
40	1.16 1.63	1.18 1.62	1.19 1.61	1.20 1.60	1.22 1.59	1.23 1.57	1.25 1.56	1.26 1.55	1.28 1.54	1.30 1.52	1.31 1.51	1.33 1.49	1.35 1.48	1.36 1.46	1.38 1.45
41	1.18 1.61	1.20 1.60	1.21 1.59	1.22 1.58	1.24 1.57	1.25 1.56	1.27 1.55	1.28 1.53	1.30 1.52	1.31 1.51	1.33 1.49	1.35 1.48	1.36 1.46	1.38 1.45	1.40 1.43
42	1.20 1.60	1.21 1.59	1.23 1.58	1.24 1.57	1.26 1.56	1.27 1.54	1.29 1.53	1.30 1.52	1.32 1.51	1.33 1.49	1.35 1.48	1.36 1.46	1.38 1.45	1.40 1.43	1.41 1.41

For bevel gears with axes at right angles only.

DIAMETER INCREMENT—(*Continued.*)

DIAMETER INCREMENT-GEAR

PINION	72	71	70	69	68	67	66	65	64	63	62	61	60	59	58	57
12	.33 1.97	.33 1.97	.34 1.97	.34 1.97	.35 1.97	.35 1.97	.36 1.97	.36 1.97	.37 1.97	.37 1.96	.38 1.96	.39 1.96	.39 1.96	.40 1.96	.41 1.96	.41 1.96
13	.36 1.97	.36 1.97	.37 1.97	.37 1.97	.38 1.96	.38 1.96	.39 1.96	.39 1.96	.40 1.96	.40 1.96	.41 1.96	.42 1.96	.42 1.95	.43 1.95	.44 1.95	.44 1.95
14	.38 1.96	.39 1.96	.39 1.96	.40 1.96	.40 1.96	.41 1.96	.42 1.96	.42 1.96	.43 1.95	.43 1.95	.44 1.95	.45 1.95	.45 1.95	.46 1.95	.47 1.94	.48 1.94
15	.41 1.96	.41 1.96	.42 1.96	.42 1.95	.43 1.95	.44 1.95	.44 1.95	.45 1.95	.46 1.95	.46 1.95	.47 1.94	.48 1.94	.48 1.94	.49 1.94	.50 1.94	.51 1.94
16	.43 1.95	.44 1.95	.45 1.95	.45 1.95	.46 1.95	.46 1.95	.47 1.94	.48 1.94	.48 1.94	.49 1.94	.50 1.94	.51 1.93	.52 1.93	.52 1.93	.53 1.93	.54 1.93
17	.46 1.95	.47 1.95	.47 1.94	.48 1.94	.48 1.94	.49 1.94	.50 1.94	.51 1.93	.51 1.93	.52 1.93	.53 1.93	.54 1.93	.55 1.92	.55 1.92	.56 1.92	.57 1.92
18	.48 1.94	.49 1.94	.50 1.94	.50 1.94	.51 1.93	.52 1.93	.53 1.93	.53 1.93	.54 1.93	.55 1.92	.56 1.92	.57 1.92	.57 1.92	.58 1.91	.59 1.91	.60 1.91
19	.51 1.93	.52 1.93	.52 1.93	.53 1.93	.54 1.93	.55 1.92	.55 1.92	.56 1.92	.57 1.92	.58 1.91	.59 1.91	.59 1.91	.60 1.91	.61 1.90	.62 1.90	.63 1.90
20	.54 1.93	.54 1.93	.55 1.92	.56 1.92	.56 1.92	.57 1.92	.58 1.91	.59 1.91	.60 1.91	.61 1.91	.61 1.90	.62 1.90	.63 1.90	.64 1.89	.65 1.89	.66 1.89
21	.56 1.92	.57 1.92	.57 1.92	.58 1.91	.59 1.91	.60 1.91	.61 1.91	.61 1.90	.62 1.90	.63 1.90	.64 1.89	.65 1.89	.66 1.89	.67 1.88	.68 1.88	.70 1.87
22	.58 1.91	.59 1.91	.60 1.91	.61 1.91	.62 1.90	.62 1.90	.63 1.90	.64 1.89	.65 1.89	.66 1.89	.67 1.88	.68 1.88	.69 1.88	.70 1.87	.71 1.87	.72 1.87
23	.61 1.91	.62 1.90	.62 1.90	.63 1.90	.64 1.89	.65 1.89	.66 1.89	.67 1.89	.68 1.88	.69 1.88	.70 1.88	.71 1.87	.72 1.87	.73 1.86	.74 1.86	.75 1.85
24	.63 1.90	.64 1.89	.65 1.89	.66 1.89	.67 1.89	.67 1.88	.68 1.88	.69 1.88	.70 1.87	.71 1.87	.72 1.87	.73 1.86	.74 1.86	.75 1.85	.76 1.85	.78 1.84
25	.66 1.89	.67 1.88	.67 1.88	.68 1.88	.69 1.88	.70 1.87	.71 1.87	.72 1.87	.73 1.86	.74 1.86	.75 1.86	.76 1.85	.77 1.85	.78 1.84	.79 1.84	.80 1.83
26	.68 1.88	.69 1.88	.70 1.87	.71 1.87	.71 1.87	.72 1.86	.73 1.86	.74 1.86	.75 1.85	.76 1.85	.77 1.84	.78 1.84	.80 1.84	.81 1.83	.82 1.82	.83 1.82
27	.70 1.87	.71 1.87	.72 1.87	.73 1.86	.74 1.86	.75 1.86	.76 1.85	.77 1.85	.78 1.84	.79 1.84	.80 1.83	.81 1.83	.82 1.82	.83 1.82	.84 1.81	.86 1.81
28	.72 1.86	.73 1.86	.74 1.86	.75 1.85	.76 1.85	.77 1.85	.78 1.84	.79 1.84	.80 1.83	.81 1.83	.82 1.82	.83 1.82	.85 1.81	.86 1.81	.87 1.80	.88 1.80
29	.75 1.86	.76 1.85	.77 1.85	.78 1.84	.78 1.84	.79 1.84	.80 1.83	.82 1.83	.83 1.82	.84 1.82	.85 1.81	.86 1.81	.87 1.80	.88 1.80	.89 1.79	.91 1.78
30	.77 1.85	.78 1.84	.79 1.84	.80 1.83	.81 1.83	.82 1.83	.83 1.82	.84 1.82	.85 1.81	.86 1.81	.87 1.80	.88 1.79	.89 1.79	.91 1.78	.92 1.78	.93 1.77
31	.79 1.84	.80 1.83	.81 1.83	.82 1.82	.83 1.82	.84 1.82	.85 1.81	.86 1.81	.87 1.80	.88 1.79	.89 1.79	.91 1.78	.92 1.78	.93 1.77	.94 1.76	.96 1.76
32	.81 1.83	.82 1.82	.83 1.82	.84 1.81	.85 1.81	.86 1.80	.87 1.80	.88 1.79	.89 1.79	.91 1.78	.92 1.78	.93 1.77	.94 1.76	.95 1.76	.97 1.75	.98 1.74
33	.83 1.82	.84 1.81	.85 1.81	.86 1.80	.87 1.80	.88 1.79	.89 1.79	.91 1.78	.92 1.78	.93 1.77	.94 1.77	.95 1.76	.96 1.75	.98 1.75	.99 1.74	1.00 1.73
34	.85 1.81	.86 1.80	.87 1.80	.88 1.79	.89 1.79	.91 1.78	.92 1.78	.93 1.77	.94 1.77	.95 1.76	.96 1.75	.97 1.75	.99 1.74	1.00 1.73	1.01 1.73	1.02 1.72
35	.87 1.80	.88 1.79	.89 1.79	.90 1.78	.92 1.78	.93 1.77	.94 1.77	.95 1.76	.96 1.75	.97 1.75	.98 1.74	1.00 1.73	1.01 1.73	1.02 1.72	1.03 1.71	1.05 1.70
36	.89 1.79	.90 1.78	.91 1.78	.93 1.77	.94 1.77	.95 1.76	.96 1.76	.97 1.75	.98 1.74	.99 1.74	1.00 1.73	1.02 1.72	1.03 1.71	1.04 1.71	1.05 1.70	1.07 1.69
37	.91 1.78	.92 1.77	.93 1.77	.95 1.76	.96 1.76	.97 1.75	.98 1.74	.99 1.74	1.00 1.73	1.01 1.72	1.03 1.72	1.04 1.71	1.05 1.70	1.06 1.69	1.08 1.69	1.09 1.68
38	.93 1.77	.94 1.76	.95 1.76	.97 1.75	.98 1.75	.99 1.74	1.00 1.73	1.01 1.73	1.02 1.72	1.03 1.71	1.05 1.71	1.06 1.70	1.07 1.69	1.08 1.68	1.10 1.67	1.11 1.66
39	.95 1.76	.96 1.75	.97 1.75	.98 1.74	.99 1.73	1.01 1.73	1.02 1.72	1.03 1.71	1.04 1.71	1.05 1.70	1.06 1.69	1.08 1.68	1.09 1.68	1.10 1.67	1.12 1.66	1.13 1.65
40	.97 1.75	.97 1.75	.99 1.74	1.00 1.73	1.01 1.72	1.03 1.72	1.04 1.71	1.05 1.70	1.06 1.70	1.07 1.69	1.08 1.68	1.10 1.67	1.11 1.66	1.12 1.66	1.14 1.65	1.15 1.64
41	.99 1.74	1.00 1.73	1.01 1.73	1.02 1.72	1.03 1.71	1.04 1.71	1.06 1.70	1.07 1.69	1.08 1.68	1.09 1.68	1.10 1.67	1.12 1.66	1.13 1.65	1.14 1.64	1.15 1.63	1.17 1.62
42	1.01 1.73	1.02 1.72	1.03 1.72	1.04 1.71	1.05 1.70	1.06 1.69	1.07 1.60	1.09 1.68	1.10 1.67	1.11 1.66	1.12 1.66	1.13 1.65	1.15 1.64	1.16 1.63	1.17 1.62	1.19 1.61

For bevel gears with axes at right angles only.

Tables for Angle of Edge and Angle of Face of Gears

TABLES FOR ANGLES OF EDGE AND ANGLES OF FACE.

The following four tables have been computed for the convenience in calculating data for bevel gears with axes at right angle. They *do not* hold good for bevel gears with axes at any other angle.

To use the tables the number of teeth in gear and pinion must be known.

Having located the number of teeth in the gear on the horizontal line of figures at the top of the table, and the number of teeth in the pinion on the vertical line of figures on the left-hand side, we follow the two columns to the square formed by their intersections.

The two angles found in the same square are the respective angles for gear and pinion. The tables are so arranged that the angle belonging to the gear is always placed above the angle for the pinion.

The cutting angle for a gear or pinion is equal to the angle of face of its mate as given in the following tables.

TABLE I.

ANGLE OF EDGE-GEAR

PINION	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27
12	73°41′ 16°19′	73°18′ 16°42′	72°54′ 17°6′	72°28′ 17°32′	72°2′ 17°58′	71°34′ 18°26′	71°5′ 18°55′	70°34′ 19°26′	70°1′ 19°59′	69°26′ 20°34′	68°50′ 21°10′	68°12′ 21°48′	67°31′ 22°29′	66°48′ 23°12′	66°2′ 23°58′
13	72°25′ 17°35′	71°59′ 18°1′	71°34′ 18°26′	71°7′ 18°53′	70°39′ 19°21′	70°9′ 19°51′	69°37′ 20°23′	69°5′ 20°55′	68°30′ 21°30′	67°53′ 22°7′	67°15′ 22°45′	66°34′ 23°26′	65°51′ 24°9′	65°6′ 24°54′	64°17′ 25°43′
14	71°9′ 18°51′	70°43′ 19°17′	70°15′ 19°45′	69°46′ 20°14′	69°16′ 20°44′	68°45′ 21°15′	68°12′ 21°48′	67°37′ 22°23′	67°0′ 23°0′	66°23′ 23°37′	65°42′ 24°18′	64°59′ 25°1′	64°14′ 25°46′	63°26′ 26°34′	62°36′ 27°24′
15	69°54′ 20°6′	69°26′ 20°34′	68°58′ 21°2′	68°28′ 21°32′	67°56′ 22°4′	67°23′ 22°37′	66°48′ 23°12′	66°12′ 23°48′	65°33′ 24°27′	64°53′ 25°7′	64°10′ 25°50′	63°26′ 26°34′	62°39′ 27°21′	61°49′ 28°11′	60°57′ 29°3′
16	68°41′ 21°19′	68°12′ 21°48′	67°42′ 22°18′	67°10′ 22°50′	66°37′ 23°23′	66°2′ 23°58′	65°26′ 24°34′	64°48′ 25°12′	64°8′ 25°52′	63°26′ 26°34′	62°42′ 27°18′	61°56′ 28°4′	61°7′ 28°53′	60°15′ 29°45′	59°21′ 30°39′
17	67°29′ 22°31′	66°58′ 23°2′	66°27′ 23°33′	65°54′ 24°6′	65°19′ 24°41′	64°43′ 25°17′	64°6′ 25°54′	63°26′ 26°34′	62°45′ 27°15′	62°1′ 27°59′	61°15′ 28°45′	60°28′ 29°32′	59°37′ 30°23′	58°44′ 31°16′	57°48′ 32°12′
18	66°18′ 23°42′	65°46′ 24°14′	65°14′ 24°46′	64°39′ 25°21′	64°4′ 25°56′	63°26′ 26°34′	62°47′ 27°13′	62°6′ 27°54′	61°23′ 28°37′	60°38′ 29°22′	59°51′ 30°9′	59°2′ 30°58′	58°10′ 31°50′	57°16′ 32°44′	56°19′ 33°41′
19	65°8′ 24°52′	64°36′ 25°24′	64°2′ 25°58′	63°26′ 26°34′	62°49′ 27°11′	62°10′ 27°50′	61°30′ 28°30′	60°48′ 29°12′	60°4′ 29°56′	59°18′ 30°42′	58°30′ 31°30′	57°39′ 32°21′	56°46′ 33°14′	55°51′ 34°9′	54°52′ 35°8′
20	64°0′ 26°0′	63°26′ 26°34′	62°51′ 27°9′	62°14′ 27°46′	61°37′ 28°23′	60°57′ 29°3′	60°15′ 29°45′	59°32′ 30°28′	58°47′ 31°13′	58°0′ 32°0′	57°10′ 32°50′	56°19′ 33°41′	55°24′ 34°36′	54°28′ 35°32′	53°28′ 36°32′
21	62°53′ 27°7′	62°18′ 27°42′	61°42′ 28°18′	61°4′ 28°56′	60°25′ 29°35′	59°45′ 30°15′	59°2′ 30°58′	58°18′ 31°42′	57°32′ 32°28′	56°43′ 33°17′	55°53′ 34°7′	55°0′ 35°0′	54°5′ 35°55′	53°7′ 36°53′	52°8′ 37°52′
22	61°47′ 28°13′	61°11′ 28°49′	60°34′ 29°26′	59°56′ 30°4′	59°15′ 30°45′	58°34′ 31°26′	57°51′ 32°9′	57°6′ 32°54′	56°19′ 33°41′	55°29′ 34°31′	54°38′ 35°22′	53°45′ 36°15′	52°49′ 37°11′	51°50′ 38°10′	50°49′ 39°11′
23	60°42′ 29°18′	60°6′ 29°54′	59°28′ 30°32′	58°49′ 31°11′	58°8′ 31°52′	57°25′ 32°35′	56°41′ 33°19′	55°55′ 34°5′	55°7′ 34°53′	54°18′ 35°42′	53°26′ 36°34′	52°31′ 37°29′	51°35′ 38°25′	50°36′ 39°24′	49°34′ 40°26′
24	59°39′ 30°21′	59°2′ 30°58′	58°23′ 31°37′	57°44′ 32°16′	57°2′ 32°58′	56°19′ 33°41′	55°33′ 34°27′	54°47′ 35°13′	53°58′ 36°2′	53°8′ 36°52′	52°15′ 37°45′	51°20′ 38°40′	50°23′ 39°37′	49°24′ 40°36′	48°22′ 41°38′
25	58°38′ 31 22′	58°0′ 32°0′	57°20′ 32°40′	56°40′ 33°20′	55°57′ 34°3′	55°13′ 34°47′	54°28′ 35°32′	53°40′ 36°20′	52°51′ 37°9′	52°0′ 38°0′	51°7′ 38°53′	50°12′ 39°48′	49°14′ 40°46′	48°14′ 41°46′	47°12′ 42°48′
26	57°37′ 32°23′	56°58′ 33°2′	56°19′ 33°41′	55°37′ 34°23′	54°54′ 35°6′	54°10′ 35°50′	53°24′ 36°36′	52°36′ 37°24′	51°46′ 38°14′	50°54′ 39°6′	50°1′ 39°59′	49°5′ 40°55′	48°7′ 41°53′	47°7′ 42°53′	46°5′ 43°55′
27	56°38′ 33°22′	55°59′ 34°1′	55°18′ 34°42′	54°36′ 35°24′	53°53′ 36°7′	53°7′ 36°53′	52°21′ 37°39′	51°33′ 38°27′	50°43′ 39°17′	49°51′ 40°9′	48°57′ 41°3′	48°0′ 42°0′	47°3′ 42°57′	46°2′ 43°58′	45°
28	55°40′ 34°20′	55°0′ 35°0′	54°19′ 35°41′	53°37′ 36°23′	52°53′ 37°7′	52°8′ 37°52′	51°20′ 38°40′	50°32′ 39°28′	49°41′ 40°19′	48°49′ 41°11	47°55′ 42°5′	46°58′ 43°2′	46°0′ 44°0′	45°	
29	54°44′ 35°16′	54°3′ 35°57′	53°22′ 36°38′	52°39′ 37°21′	51°55′ 38°5′	51°9′ 38°51′	50°21′ 39°39′	49°32′ 40°28′	48°41′ 41°19′	47°49′ 42°11′	46°54′ 43°6′	45°58′ 44°2′	45°		
30	53°48′ 36°12′	53°7′ 36°53′	52°26′ 37°34′	51°42′ 38°18′	50°58′ 39°2′	50°12′ 39°48′	49°24′ 40°36′	48°35′ 41°25′	47°43′ 42°17′	46°51′ 43°9′	45°56′ 44°4′	45°			
31	52°54′ 37°6′	52°13′ 37°47′	51°31′ 38°29′	50°48′ 39°12′	50°2′ 39°58′	49°16′ 40°44′	48°28′ 41°32′	47°39′ 42°21′	46°47′ 43°13′	45°54′ 44°6′	45°				
32	52°2′ 37°58′	51°20′ 38°40′	50°38′ 39°22′	49°54′ 40°6′	49°9′ 40°51′	48°22′ 41°38′	47°34′ 42°26′	46°44′ 43°16′	45°53′ 44°7′	45°					
33	51°10′ 38°50′	50°29′ 39°31′	49°46′ 40°14′	49°2′ 40°58′	48°16′ 41°44′	47°29′ 42°31′	46°41′ 43°19′	45°51′ 44°9′	45°						
34	50°20′ 39°40′	49°38′ 40°22′	48°55′ 41°5′	48°11′ 41°49′	47°25′ 42°35′	46°38′ 43°22′	45°50′ 44°10′	45°							
35	49°31′ 40°29′	48°48′ 41°12′	48°5′ 41°55′	47°21′ 42°39′	46°35′ 43°25′	45°48′ 44°12′	45°								
36	48°43′ 41°17′	48°0′ 42°0′	47°17′ 42°43′	46°33′ 43°27′	45°47′ 44°13′	45°									
37	47°56′ 42°4′	47°14′ 42°46′	46°30′ 43°30′	45°46′ 44°14′	45°										
38	47°10′ 42°50′	46°28′ 43°32′	45°45′ 44°15′	45°											
39	46°26′ 43°34′	45°43′ 44°17′	45°												
40	45°42′ 44°18′	45°													
41	45°														

TABLE I (Continued).

ANGLE OF EDGE-GEAR

PINION

	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12
12	65°14′ 24°46′	64°22′ 25°38′	63°26′ 26°34′	62°27′ 27°33′	61°23′ 28°37′	60°15′ 29°45′	59°2′ 30°58′	57°44′ 32°16′	56°19′ 33°41′	54°47′ 35°13′	53°7′ 36°53′	51°20′ 38°40′	49°24′ 40°36′	47°17′ 42°43′	45°
13	63°26′ 26°34′	62°31′ 27°29′	61°33′ 28°27′	60°31′ 29°29′	59°25′ 30°35′	58°14′ 31°46′	56°58′ 33°2′	55°37′ 34°23′	54°10′ 35°50′	52°36′ 37°24′	50°54′ 39°6′	49°5′ 40°55′	47°7′ 42°53′	45°	
14	61°42′ 28°18′	60°45′ 29°15′	59°45′ 30°15′	58°40′ 31°20′	57°32′ 32°28′	56°19′ 33°41′	55°0′ 35°0′	53°37′ 36°23′	52°8′ 37°52′	50°32′ 39°28′	48°48′ 41°12′	46°58′ 43°2′	45°		
15	60°1′ 29°50′	59°2′ 30°58′	58°0′ 32°0′	56°53′ 33°7′	55°43′ 34°17′	54°28′ 35°32′	53°7′ 36°53′	51°42′ 38°18′	50°12′ 39°48′	48°35′ 41°25′	46°51′ 43°9′	45°			
16	58°23′ 31°37′	57°23′ 32°37′	56°19′ 33°41′	55°11′ 34°49′	53°58′ 36°2′	52°42′ 37°18′	51°20′ 38°40′	49°54′ 40°6′	48°22′ 41°38′	46°44′ 43°16′	45°				
17	56°49′ 33°11′	55°47′ 34°13′	54°41′ 35°19′	53°32′ 36°28′	52°18′ 37°42′	51°0′ 39°0′	49°38′ 40°22′	48°11′ 41°49′	46°38′ 43°22′	45°					
18	55°18′ 34°42′	54°15′ 35°45′	53°7′ 36°53′	51°57′ 38°3′	50°43′ 39°17′	49°24′ 40°36′	48°0′ 42°0′	46°33′ 43°27′	45°						
19	53°51′ 36°9′	52°46′ 37°14′	51°38′ 38°22′	50°26′ 39°34′	49°11′ 40°49′	47°52′ 42°8′	46°28′ 43°32′	45°							
20	52°26′ 37°34′	51°20′ 38°40′	50°12′ 39°48′	48°59′ 41°1′	47°43′ 42°17′	46°24′ 43°36′	45°								
21	51°4′ 38°56′	49°58′ 40°2′	48°48′ 41°12′	47°36′ 42°24′	46°20′ 43°40′	45°									
22	49°46′ 40°14′	48°39′ 41°21′	47°29′ 42°31′	46°16′ 43°44′	45°										
23	48°30′ 41°30′	47°23′ 42°37′	46°13′ 43°47′	45°											
24	47°17′ 42°43′	46°10′ 43°50′	45°												
25	46°7′ 43°53′	45°													
26	45°														

$$\tan \alpha_a = \frac{N_a}{N_b}$$

$$\tan \alpha_b = \frac{N_b}{N_a}$$

(See page 18).

TABLE II.

ANGLE OF EDGE-GEAR

PINION	72	71	70	69	68	67	66	65	64	63	62	61	60	59	58	57
12	80°33' 9°27'	80°25' 9°35'	80°16' 9°44'	80°8' 9°52'	79°59' 10°1'	79°51' 10°9'	79°42' 10°18'	79°32' 10°28'	79°23' 10°37'	79°13' 10°47'	79°3' 10°57'	78°52' 11°8'	78°41' 11°19'	78°30' 11°30'	78°19' 11°41'	78°7' 11°53'
13	79°46' 10°14'	79°37' 10°23'	79°29' 10°31'	79°20' 10°40'	79°11' 10°49'	79°1' 10°59'	78°51' 11°9'	78°41' 11°19'	78°31' 11°29'	78°20' 11°40'	78°9' 11°51'	77°58' 12°2'	77°46' 12°14'	77°34' 12°26'	77°22' 12°38'	77°9' 12°51'
14	79°0' 11°0'	78°51' 11°9'	78°41' 11°19'	78°32' 11°28'	78°22' 11°38'	78°11' 11°49'	78°1' 11°59'	77°51' 12°9'	77°40' 12°20'	77°28' 12°32'	77°17' 12°43'	77°5' 12°55'	76°52' 13°8'	76°39' 13°21'	76°26' 13°34'	76°12' 13°48'
15	78°14' 11°46'	78°4' 11°56'	77°54' 12°6'	77°44' 12°16'	77°34' 12°26'	77°23' 12°37'	77°12' 12°48'	77°0' 13°0'	76°48' 13°12'	76°36' 13°24'	76°24' 13°36'	76°11' 13°49'	75°58' 14°2'	75°44' 14°16'	75°30' 14°30'	75°15' 14°45'
16	77°28' 12°32'	77°18' 12°42'	77°7' 12°53'	76°57' 13°3'	76°45' 13°15'	76°34' 13°26'	76°22' 13°38'	76°10' 13°50'	75°58' 14°2'	75°45' 14°15'	75°32' 14°28'	75°18' 14°42'	75°4' 14°56'	74°49' 15°11'	74°35' 15°25'	74°19' 15°41'
17	76°43' 13°17'	76°32' 13°28'	76°21' 13°39'	76°10' 13°50'	75°58' 14°2'	75°45' 14°14'	75°33' 14°27'	75°21' 14°39'	75°8' 14°52'	74°54' 15°6'	74°40' 15°20'	74°25' 15°35'	74°11' 15°49'	73°56' 16°4'	73°40' 16°20'	73°24' 16°36'
18	75°58' 14°2'	75°46' 14°14'	75°35' 14°25'	75°23' 14°37'	75°10' 14°50'	74°58' 15°2'	74°45' 15°15'	74°31' 15°29'	74°17' 15°43'	74°3' 15°57'	73°49' 16°11'	73°33' 16°27'	73°18' 16°42'	73°2' 16°58'	72°45' 17°15'	72°29' 17°31'
19	75°13' 14°47'	75°1' 14°59'	74°49' 15°11'	74°36' 15°24'	74°23' 15°37'	74°10' 15°50'	73°56' 16°4'	73°42' 16°18'	73°28' 16°32'	73°13' 16°47'	72°58' 17°2'	72°42' 17°18'	72°20' 17°34'	72°9' 17°51'	71°52' 18°8'	71°34' 18°26'
20	74°29' 15°31'	74°16' 15°44'	74°3' 15°57'	73°50' 16°10'	73°37' 16°23'	73°23' 16°42'	73°9' 16°51'	72°54' 17°6'	72°39' 17°21'	72°23' 17°37'	72°7' 17°53'	71°51' 18°9'	71°34' 18°26'	71°16' 18°44'	70°59' 19°1'	70°40' 19°20'
21	73°45' 16°15'	73°32' 16°28'	73°18' 16°42'	73°4' 16°56'	72°50' 17°10'	72°36' 17°24'	72°21' 17°39'	72°6' 17°54'	71°50' 18°10'	71°34' 18°26'	71°17' 18°43'	71°0' 19°0'	70°43' 19°17'	70°24' 19°36'	70°6 19°54'	69°46' 20°24'
22	73°1' 16°59'	72°47' 17°13'	72°33' 17°27'	72°19' 17°41'	72°4' 17°56'	71°49' 18°11'	71°34' 18°26'	71°18' 18°42'	71°2' 18°58'	70°45' 19°15'	70°28' 19°34'	70°10' 19°50'	69°52' 20°8'	69°33' 20°27'	69°13' 20°47'	68°54' 21°6'
23	72°17' 17°43'	72°3' 17°57'	71°49' 18°11'	71°34' 18°26'	71°19' 18°41'	71°3' 18°57'	70°47' 19°13'	70°30' 19°30'	70°14' 19°46'	69°57' 20°3'	69°39' 20°21'	69°20' 20°40'	69°2' 20°58'	68°42' 21°18'	68°22' 21°38'	68°2' 21°58'
24	71°34' 18°26'	71°19' 18°41'	71°5' 18°55'	70°49' 19°11'	70°34' 19°26'	70°17' 19°43'	70°1' 19°59'	69°44' 20°16'	69°26' 20°34'	69°9' 20°51'	68°50' 21°10'	68°31' 21°29'	68°12' 21°48'	67°52' 22°8'	67°31' 22°29'	67°10' 22°50'
25	70°51' 19°9'	70°36' 19°24'	70°21' 19°39'	70°5' 19°55'	69°49' 20°11'	69°32' 20°28'	69°15' 20°45'	68°57' 21°3'	68°40' 21°20'	68°21' 21°39'	68°3' 21°57'	67°43' 22°17'	67°23' 22°37'	67°2' 22°58'	66°41' 23°19'	66°19' 23°41'
26	70°9' 19°51'	69°53' 20°7'	69°37' 20°23'	69°21' 20°39'	69°4' 20°56'	68°48' 21°12'	68°30' 21°30'	68°12' 21°48'	67°54' 22°6'	67°34' 22°26'	67°15' 22°45'	66°55' 23°5'	66°34' 23°26'	66°13' 23°47'	65°51' 24°9'	65°29' 24°31
27	69°27' 20°33'	69°10' 20°50'	68°54' 21°6'	68°38' 21°22'	68°20' 21°40'	68°3' 21°57'	67°45' 22°15'	67°26' 22°34'	67°8' 22°52'	66°48' 23°12'	66°28' 23°32'	66°7' 23°53'	65°46' 24°14'	65°25' 24°35'	65°2' 24°58'	64°39' 25°21'
28	68°45' 21°15'	68°29' 21°31'	68°12' 21°48'	67°55' 22°5'	67°37' 22°23'	67°19' 22°41'	67°1' 22°59'	66°42' 23°18'	66°22' 23°38'	66°2' 23°58'	65°42' 24°18'	65°21' 24°39'	64°59' 25°1'	64°37' 25°23'	64°14' 25°46'	63°50' 26°10'
29	68°4' 21°56'	67°47' 22°13'	67°30' 22°30'	67°12' 22°48'	66°54' 23°6'	66°36' 23°24'	66°17' 23°43'	65°57' 24°3'	65°37' 24°23'	65°16' 24°44'	64°55' 25°5'	64°34' 25°26'	64°12' 25°48'	63°50' 26°10'	63°26' 26°34'	63°2' 26°58'
30	67°23' 22°37'	67°6' 22°54'	66°48' 23°12'	66°30' 23°30'	66°12' 23°48'	65°52' 24°8'	65°33' 24°27'	65°14' 24°46'	64°53' 25°7'	64°32' 25°28'	64°10' 25°50'	63°49' 26°11'	63°26' 26°34'	63°3' 26°57'	62°39' 27°21'	62°14' 27°46'
31	66°42' 23°18'	66°25' 23°35'	66°6' 23°54'	65°48' 24°12'	65°29' 24°31'	65°10' 24°50'	64°50' 25°10'	64°30' 25°30'	64°9' 25°51'	63°48' 26°12'	63°26' 26°34'	63°3' 26°57'	62°40' 27°20'	62°18' 27°42'	61°53' 28°7'	61°28' 28°32'
32	66°2' 23°58'	65°44' 24°16'	65°26' 24°34'	65°7' 24°53'	64°48' 25°12'	64°28' 25°32'	64°8' 25°52'	63°47' 26°13'	63°26' 26°34'	63°4' 26°56'	62°42' 27°18'	62°19' 27°41'	61°56' 28°4'	61°32' 28°28'	61°7' 28°53'	60°41' 29°19'
33	65°23' 24°37'	65°4' 24°56'	64°45' 25°15'	64°26' 25°34'	64°7' 25°53'	63°47' 26°13'	63°26' 26°34'	63°5' 26°55'	62°43' 27°17'	62°21' 27°39'	61°58' 28°2'	61°35' 28°25'	61°11' 28°49'	60°47' 29°13'	60°21' 29°39'	59°56' 30°4'
34	64°43' 25°17'	64°25' 25°35'	64°5' 25°55'	63°46' 26°14'	63°26' 26°34'	63°5' 26°55'	62°45' 27°15'	62°23' 27°37'	62°1' 27°59'	61°38' 28°22'	61°15' 28°45'	60°52' 29°8'	60°28' 29°32'	60°3' 29°57'	59°37' 30°23'	59°11' 30°49'
35	64°5' 25°55'	63°45' 26°15'	63°26' 26°34'	63°6' 26°54'	62°46' 27°14'	62°25' 27°35'	62°4' 27°56'	61°42' 28°18'	61°19' 28°41'	60°57' 29°3'	60°33' 29°27'	60°9' 29°51'	59°45' 30°15'	59°19' 30°41'	58°53' 31°7'	58°27' 31°33'
36	63°26' 26°34'	63°7' 26°53'	62°47' 27°13'	62°27' 27°33'	62°6' 27°54'	61°45' 28°15'	61°23' 28°37'	61°1' 28°59'	60°38' 29°22'	60°15' 29°45'	59°51' 30°9'	59°27' 30°33'	59°2' 30°58'	58°37' 31°23'	58°10' 31°50'	57°43' 32°17'
37	62°48' 27°12'	62°28' 27°32'	62°8' 27°52'	61°48' 28°12'	61°27' 28°33'	61°5' 28°55'	60°44' 29°16'	60°21' 29°39'	59°58' 30°2'	59°35' 30°25'	59°10' 30°50'	58°46' 31°14'	58°20' 31°40'	57°54' 32°6'	57°28' 32°32'	57°1' 32°59'
38	62°11' 27°49'	61°51' 28°9'	61°30' 28°30'	61°9' 28°51'	60°48' 29°12'	60°26' 29°34'	60°4' 29°56'	59°41' 30°19'	59°18' 30°42'	58°54' 31°6'	58°30' 31°30'	58°5' 31°55'	57°39' 32°21'	57°13' 32°47'	56°46' 33°14'	56°19' 33°41'
39	61°33' 28°27'	61°13' 28°47'	60°53' 29°7'	60°31' 29°29'	60°10' 29°50'	59°48' 30°12'	59°25' 30°35'	59°2' 30°58'	58°39' 31°21'	58°14' 31°46'	57°50' 32°10'	57°24' 32°36'	56°58' 33°2'	56°32' 33°28'	56°6' 33°54'	55°37' 34°23'
40	60°57' 29°3'	60°36' 29°24'	60°15' 29°45'	59°53' 30°7'	59°32' 30°28'	59°10' 30°50'	58°47' 31°13'	58°24' 31°36'	58°0' 32°0'	57°35' 32°25'	57°10' 32°50'	56°44' 33°16'	56°19' 33°41'	55°52' 34°8'	53°24' 34°35'	54°57' 35°3'
41	60°20' 29°40'	60°0' 30°0'	59°39' 30°21'	59°17' 30°43'	58°55' 31°5'	58°32' 31°28'	58°9' 31°51'	57°45' 32°15'	57°21' 32°39'	56°57' 33°3'	56°32' 33°28'	56°6' 33°54'	55°39' 34°21'	55°12' 34°48'	54°44' 35°16'	54°16' 35°44'
42	59°45' 30°15'	59°24' 30°36'	59°3' 30°57'	58°40' 31°20'	58°18' 31°42'	57°55' 32°5'	57°32' 32°28'	57°8' 32°52'	56°43' 33°17'	56°19' 33°41'	55°53' 34°7'	55°27' 34°33'	55°0' 35°0'	54°33' 35°27'	54°5' 35°55'	53°37' 36°23'

TABLE II (Continued).

ANGLE OF EDGE-GEAR

PINION	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42
12	77°54′ 12°6′	77°42′ 12°18′	77°28′ 12°32′	77°15′ 12°45′	77°0′ 13°0′	76°46′ 13°14′	76°30′ 13°30′	76°14′ 13°46′	75°58′ 14°2′	75°41′ 14°19′	75°23′ 14°37′	75°4′ 14°56′	74°45′ 15°15′	74°25′ 15°35′	74°3′ 15°57′
13	76°56′ 13°4′	76°42′ 13°18′	76°28′ 13°32′	76°13′ 13°47	75°58′ 14°2′	75°42′ 14°18′	75°26′ 14°34′	75°8′ 14°52′	74°51′ 15°9′	74°32′ 15°28′	74°13′ 15°47′	73°53′ 16°7′	73°32′ 16°28′	73°11′ 16°49′	72°48′ 17°12′
14	75°58′ 14°2′	75°43′ 14°17′	75°28′ 14°32′	75°12′ 14°48′	74°56′ 15°4′	74°39′ 15°21′	74°21′ 15°39′	74°3′ 15°57′	73°44′ 16°16′	73°25′ 16°35′	73°4′ 16°56′	72°43′ 17°17′	72°21′ 17°39′	71°58′ 18°2′	71°34′ 18°26′
15	75°0′ 15°0′	74°44′ 15°16′	74°29′ 15°31′	74°12′ 15°48′	73°55′ 16°5′	73°37′ 16°23′	73°18′ 16°42′	72°59′ 17°1′	72°39′ 17°21′	72°18′ 17°42′	71°56′ 18°4′	71°34′ 18°26′	71°10′ 18°50′	70°46′ 19°14′	70°21′ 19°39′
16	74°3′ 15°57′	73°47′ 16°13′	73°30′ 16°30′	73°12′ 16°48′	72°54′ 17°6′	72°35′ 17°25′	72°15′ 17°45′	71°55′ 18°5′	71°34′ 18°26′	71°12′ 18°48′	70°49′ 19°11′	70°26′ 19°34′	70°1′ 19°59′	69°35′ 20°25′	69°9′ 20°51′
17	73°7′ 16°53′	72°49′ 17°11′	72°31′ 17°29′	72°13′ 17°47′	71°54′ 18°6′	71°34′ 18°26′	71°13′ 18°47′	70°52′ 19°8′	70°30′ 19°30′	70°7′ 19°53′	69°43′ 20°17′	69°17′ 20°43′	68°52′ 21°8′	68°26′ 21°34′	67°58′ 22°2′
18	72°11′ 17°49′	71°53′ 18°7′	71°34′ 18°26′	71°15′ 18°45′	70°54′ 19°6′	70°33′ 19°27′	70°12′ 19°48′	69°50′ 20°10′	69°26′ 20°34′	69°3′ 20°57′	68°38′ 21°22′	68°12′ 21°48′	67°45′ 22°15′	67°17′ 22°43′	66°48′ 23°12′
19	71°15′ 18°45′	70°57′ 19°1′	70°37′ 19°23′	70°17′ 19°43′	69°56′ 20°4′	69°34′ 20°26′	69°12′ 20°48′	68°48′ 21°12′	68°25′ 21°35′	67°59′ 22°1′	67°34′ 22°26′	67°6′ 22°54′	66°38′ 23°22′	66°10′ 23°50′	65°39 24°21′
20	70°21′ 19°39′	70°1′ 19°59′	69°41′ 20°19′	69°19′ 20°41′	68°57′ 21°3′	68°35′ 21°25′	68°12′ 21°48′	67°48′ 22°12′	67°23′ 22°37′	66°57′ 23°3′	66°30′ 23°30′	66°2′ 23°58′	65°33′ 24°27′	65°3′ 24°57′	64°32′ 25°28′
21	69°26′ 20°34′	69°6′ 20°54′	68°45′ 21°15′	68°23′ 21°37′	68°0′ 22°0′	67°37′ 22°23′	67°13′ 22°47′	66°48′ 23°12′	66°22′ 23°38′	65°55′ 24°5′	65°28′ 24°32′	64°59′ 25°1′	64°29′ 25°31′	63°58′ 26°2′	63°26′ 26°34′
22	68°33′ 21°27′	68°12′ 21°48′	67°50′ 22°10′	67°27′ 22°33′	67°4′ 22°56′	66°40′ 23°20′	66°15′ 23°45′	65°49′ 24°11′	65°23′ 24°37′	64°55′ 25°5′	64°26′ 25°34′	63°57′ 26°3′	63°26′ 26°34′	62°54′ 27°6′	62°21′ 27°39′
23	67°41 22°19′	67°18′ 22°42′	66°55′ 23°5′	66°32′ 23°28′	66°8′ 23°52′	65°44′ 24°16′	65°18′ 24°42′	64°51′ 25°9′	64°24′ 25°36′	63°55′ 26°5′	63°26′ 26°34′	62°56′ 27°4′	62°24′ 27°36′	61°52′ 28°8′	61°18′ 28°42′
24	66°48′ 23°12′	66°26′ 23°34′	66°2′ 23°58′	65°38′ 24°22′	65°14′ 24°46′	64°48′ 25°12′	64°22′ 25°38′	63°54′ 26°6′	63°26′ 26°34′	62°57′ 27°3′	62°27′ 27°33′	61°56′ 28°4′	61°23′ 28°37′	60°50′ 29°10′	60°15′ 29°45′
25	65°57′ 24°3′	65°33′ 24°27′	65°9′ 24°51′	64°45′ 25°15′	64°20′ 25°40′	63°53′ 26°7′	63°26′ 26°34′	62°58′ 27°2′	62°29′ 27°31′	61°59′ 28°1′	61°29′ 28°31′	60°57′ 29°3′	60°24′ 29°36′	59°50′ 30°10′	59°14′ 30°46′
26	65°6′ 24°54′	64°42′ 25°18′	64°18′ 25°42′	63°52′ 26°8′	63°26′ 26°34′	62°59′ 27°1′	62°31′ 27°29′	62°3′ 27°57′	61°33′ 28°27′	61°3′ 28°57′	60°31′ 29°29′	59°59′ 30°1′	59°25′ 30°35′	58°50′ 31°10′	58°14′ 31°46′
27	64°16′ 25°44′	63°51′ 26°9′	63°26′ 26°34′	63°0′ 27°0′	62°34′ 27°26′	62°6′ 27°54′	61°38′ 28°22′	61°8′ 28°52′	60°38′ 29°22′	60°7′ 29°53′	59°35′ 30°25′	59°2′ 30°58′	58°28′ 31°32′	57°53′ 32°7′	57°16′ 32°44′
28	63°26′ 26°34′	63°1′ 26°59′	62°36′ 27°24′	62°9′ 27°51′	61°42′ 28°18′	61°14′ 28°46′	60°45′ 29°15′	60°15′ 29°45′	59°45′ 30°15′	59°13′ 30°47′	58°40′ 31°20′	58°7′ 31°53′	57°32′ 32°28′	56°56′ 33°4′	56°19′ 33°41′
29	62°37′ 27°23′	62°12′ 27°48′	61°45′ 28°15′	61°19′ 28°41′	60°51′ 29°9′	60°23′ 29°37′	59°53′ 30°7′	59°23′ 30°37′	58°52′ 31°8′	58°19′ 31°41′	57°46′ 32°14′	57°12′ 32°48′	56°37′ 33°23′	56°0′ 34°0′	55°23′ 34°37′
30	61°49′ 28°11′	61°23′ 28°37′	60°57′ 29°3′	60°29′ 29°31′	60°1′ 29°59	59°32′ 30°28′	59°2′ 30°58′	58°32′ 31°28′	58°0′ 32°0′	57°27′ 32°33′	56°53′ 33°7′	56°19′ 33°41′	55°43′ 34°17′	55°5′ 34°55′	54°28′ 35°32′
31	61°2′ 28°58′	60°36′ 29°24′	60°6′ 29°54′	59°41′ 30°19′	59°12′ 30°48′	58°42 31°18′	58°12′ 31°48′	57°41′ 32°19′	57°8′ 32°52′	56°36′ 33°24′	56°1′ 33°59′	55°26′ 34°34′	54°50′ 35°10′	54°12′ 35°48′	53°34′ 36°26′
32	60°15 29°45	59°48′ 30°12′	59°21′ 30°39′	58°52′ 31°8′	58°34′ 31°26′	57°54′ 32°6′	57°23′ 32°37′	56°52′ 33°8′	56°19′ 33°41′	55°45′ 34°15′	55°11′ 34°49′	54°35′ 35°25′	53°58′ 36°2′	53°21′ 36°39′	52°42′ 37°18′
33	59°29′ 30°31′	59°2′ 30°58′	58°34′ 31°26′	58°5′ 31°55′	57°36′ 32°24′	57°6′ 32°54′	56°34′ 33°26′	56°2′ 33°58′	55°30′ 34°30′	54°56′ 35°4′	54°21′ 35°39′	53°45′ 36°15′	53°8′ 36°52′	52°29′ 37°31′	51°50′ 38°9′
34	58°44′ 31°16′	58°10′ 31°44′	57°48′ 32°12′	57°19′ 32°41′	56°49′ 33°11′	56°19′ 33°41′	55°47′ 34°13′	55°15′ 34°45′	54°41′ 35°19′	54°7′ 35°53′	53°32′ 36°28′	52°52′ 37°8′	52°18′ 37°42′	51°40′ 38°20′	51°0′ 39°0′
35	58°0′ 32°0′	57°32′ 32°28′	57°3′ 32°57′	56°33′ 33°27′	56°3′ 33°57′	55°32′ 34°28′	55°0′ 35°0′	54°28′ 35°32′	53°54′ 36°6′	53°20′ 36°40′	52°44′ 37°16′	52°8′ 37°52′	51°30′ 38°30′	50°51′ 39°9′	50°12′ 39°48′
36	57°16′ 32°44′	56°48′ 33°12′	56°19′ 33°41′	55°49′ 34°11′	55°18′ 34°42′	54°47′ 35°13′	54°15′ 35°45′	53°42′ 36°18′	53°8′ 36°52′	52°33′ 37°27′	51°57′ 38°3′	51°20′ 38°40′	50°43′ 39°17′	50°4′ 39°56′	49°24′ 40°36′
37	56°32′ 33°28′	56°4′ 33°56	55°35′ 34°25′	55°5′ 34°55′	54°34′ 35°26′	54°2′ 35°58′	53°30′ 36°30′	52°56′ 37°4′	52°23′ 37°37′	51°47′ 38°13′	51°12′ 38°48′	50°35′ 39°25′	49°56′ 40°4′	49°17′ 40°43′	48°37′ 41°23′
38	55°51′ 34°9′	55°21′ 34°39′	54°52′ 35°8′	54°23′ 35°37′	53°51′ 36°9′	53°18′ 36°42′	52°46′ 37°14′	52°12′ 37°48′	51°38′ 38°22′	51°3′ 38°57′	50°27′ 39°33′	49°49′ 40°11′	49°11′ 40°49′	48°32′ 41°28′	47°52′ 42°8′
39	55°9′ 34°51′	54°39′ 35°21′	54°10′ 35°50′	53°39′ 36°21′	53°7′ 36°53′	52°36′ 37°24′	52°3′ 37°57′	51°29′ 38°31′	50°54′ 39°6′	50°19′ 39°41′	49°42′ 40°18′	49°5′ 40°55′	48°27′ 41°33′	47°48′ 42°12′	47°7′ 42°53′
40	54°28′ 35°32′	53°58′ 36°2′	53°28′ 36°32′	52°58′ 37°2′	52°26′ 37°34′	51°54′ 38°6′	51°20′ 38°40′	50°46′ 39°14′	50°12′ 39°48′	49°36′ 40°24′	48°59′ 41°1′	48°22′ 41°38′	47°44′ 42°16′	47°5′ 42°55′	46°24′ 43°36′
41	53°48′ 36°12′	53°17′ 36°43′	52°48′ 37°12′	52°16′ 37°44′	51°45′ 38°15′	51°12′ 38°48′	50°39′ 39°21′	50°5′ 39°55′	49°30′ 40°30′	48°54′ 41°6′	48°17′ 41°43′	47°40′ 42°20′	47°1′ 42°59′	46°22′ 43°38′	45°41′ 44°19′
42	53°8′ 36°52′	52°38′ 37°22′	52°8′ 37°52′	51°36′ 38°24′	51°4′ 38°56′	50°32′ 39°28′	49°58′ 40°2′	49°24′ 40°36′	48°49′ 41°11′	48°13′ 41°47′	47°36′ 42°24′	46°59′ 43°1′	46°20′ 43°40′	45°40′ 44°20′	45°

TABLE III.

ANGLE OF FACE-GEAR

PINION

	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27
12	13°37′ 70°59′	13°57′ 70°33′	14°18′ 70°6′	14°39′ 69°35′	15°1′ 69°5′	15°24′ 68°32′	15°49′ 67°59′	16°15′ 67°23′	16°43′ 66°45′	17°13′ 66°5′	17°43′ 65°23′	18°15′ 64°39′	18°51′ 63°53′	19°27′ 63°3′	20°5′ 62°9′
13	14°55′ 69°45′	15°17′ 69°15′	15°39′ 68°47′	16°1′ 68°15′	16°25′ 67°43′	16°51′ 67°9′	17°19′ 66°33′	17°46′ 65°56′	18°16′ 65°16′	18°48′ 64°34′	19°21′ 63°51′	19°57′ 63°5′	20°32′ 62°14′	21°11′ 61°23′	21°54′ 60°28′
14	16°13′ 68°31′	16°34′ 68°0′	16°59′ 67°29′	17°24′ 66°56′	17°50′ 66°22′	18°17′ 65°47′	18°45′ 65°9′	19°16′ 64°30′	19°48′ 63°48′	20°20′ 63°6′	20°56′ 62°20′	21°34′ 61°32′	22°13′ 60°41′	22°55′ 59°47′	23°38′ 58°50′
15	17°28′ 67°16′	17°53′ 66°45′	18°18′ 66°14′	18°44′ 65°40′	19°11′ 65°3′	19°40′ 64°26′	20°11′ 63°49′	20°44′ 63°8′	21°18′ 62°24′	21°53′ 61°39′	22°31′ 60°51′	23°10′ 60°2′	23°51′ 59°9′	24°35′ 58°13′	25°20′ 57°14′
16	18°42′ 66°4′	19°9′ 65°33′	19°35′ 64°59′	20°3′ 64°23′	20°32′ 63°46′	21°3′ 63°7′	21°36′ 62°28′	22°9′ 61°45′	22°45′ 61°01′	23°22′ 60°14′	24°1′ 59°25′	24°42′ 58°34′	25°26′ 57°40′	26°12′ 56°42′	27°1′ 55°43′
17	19°56′ 64°54′	20°24′ 64°20′	20°51′ 63°45′	21°21′ 63°9′	21°53′ 62°31′	22°24′ 61°50′	22°57′ 61°9′	23°33′ 60°25′	24°10′ 59°40′	24°50′ 58°52′	25°31′ 58°1′	26°14′ 57°10′	27°59′ 56°13′	27°47′ 55°15′	28°37′ 54°13′
18	21°9′ 63°45′	21°37′ 63°9′	22°6′ 62°34′	22°38′ 61°56′	23°9′ 61°17′	23°43′ 60°35′	24°18′ 59°52′	24°56′ 59°8′	25°34′ 58°20′	26°15′ 57°31′	26°57′ 56°39′	27°42′ 55°46′	28°29′ 54°49′	29°18′ 53°50′	30°9′ 52°47′
19	22°20′ 62°36′	22°49′ 62°1′	23°20′ 61°24′	23°52′ 60°44′	24°26′ 60°4′	25°1′ 59°21′	25°37′ 58°37′	26°15′ 57°51′	26°56′ 57°4′	27°38′ 56°14′	28°22′ 55°22′	29°8′ 54°26′	29°56′ 53°28′	30°43′ 52°28′	31°40′ 51°24′
20	23°30′ 61°30′	24°1′ 60°53′	24°32′ 60°14′	25°6′ 59°34′	25°40′ 58°54′	26°16′ 58°10′	26°55′ 57°25′	27°34′ 56°38′	28°15′ 55°49′	28°58′ 54°58′	29°44′ 54°4′	30°31′ 53°9′	31°21′ 52°9′	32°13′ 51°9′	33°8′ 50°4′
21	24°39′ 60°25′	25°10′ 59°46′	25°43′ 59°7′	26°18′ 58°26′	26°53′ 57°43′	27°30′ 57°0′	28°10′ 56°14′	28°50′ 55°26′	29°32′ 54°36′	30°17′ 53°43′	31°4′ 52°50′	31°52′ 51°52′	32°43′ 50°53′	33°36′ 49°50′	34°31′ 48°47′
22	25°46′ 59°20′	26°19′ 58°41′	26°53′ 58°1′	27°27′ 57°19′	28°5′ 56°35′	28°43′ 55°51′	29°22′ 55°4′	30°5′ 54°17′	30°48′ 53°26′	31°34′ 52°32′	32°22′ 51°38′	33°11′ 50°41′	34°3′ 49°41′	34°57′ 48°37′	35°54′ 47°32′
23	26°52′ 58°16′	27°26′ 57°38′	28°0′ 56°56′	28°36′ 56°14′	29°14′ 55°30′	29°53′ 54°43′	30°35′ 53°57′	31°18′ 53°8′	32°1′ 52°15′	32°48′ 51°24′	33°36′ 50°28′	34°27′ 49°29′	35°20′ 48°30′	36°15′ 47°27′	37°12′ 46°20′
24	27°57′ 57°15′	28°31′ 56°35′	29°7′ 55°53′	29°43′ 55°11′	30°22′ 54°26′	31°2′ 53°40′	31°45′ 52°51′	32°28′ 52°2′	33°14′ 51°10′	34°1′ 50°5′	34°50′ 49°20′	35°42′ 48°22′	36°35′ 47°21′	37°30′ 46°18′	38°28′ 45°12′
25	28°59′ 56°15′	29°34′ 55°34′	30°12′ 54°52′	30°49′ 54°9′	31°29′ 53°23′	32°10′ 52°36′	32°52′ 51°48′	33°37′ 50°57′	34°23′ 50°5′	35°11′ 49°11′	36°0′ 48°14′	36°52′ 47°16′	37°47′ 46°15′	38°43′ 45°11′	39°41′ 44°5′
26	30°1′ 55°15′	30°38′ 54°34′	31°14′ 53°52′	31°54′ 53°8′	32°34′ 52°22′	33°15′ 51°35′	33°58′ 50°46′	34°45′ 49°55′	35°31′ 49°3′	36°19′ 48°7′	37°10′ 47°12′	38°2′ 46°12′	38°56′ 45°10′	39°53′ 44°7′	40°52′ 43°2′
27	31°3′ 54°19′	31°39′ 53°37′	32°18′ 52°54′	32°57′ 52°9′	33°37′ 51°23′	34°20′ 50°34′	35°3′ 49°45′	35°49′ 48°55′	36°36′ 48°2′	37°25′ 47°7′	38°16′ 46°10′	39°10′ 45°10′	40°4′ 44°10′	41°1′ 43°5′	42°
28	32°2′ 53°22′	32°39′ 52°39′	33°18′ 51°56′	33°57′ 51°11′	34°39′ 50°25′	35°21′ 49°31′	36°7′ 48°47′	36°52′ 47°56′	37°40′ 47°2′	38°29′ 46°7′	39°21′ 45°11′	40°15′ 44°11′	41°9′ 43°9′	42°7′	
29	32°59′ 52°27′	33°38′ 51°44′	34°17′ 51°1′	34°58′ 50°16′	35°39′ 49°29′	36°23′ 48°41′	37°8′ 47°50′	37°54′ 46°58′	38°42′ 46°4′	39°32′ 45°10′	40°24′ 44°12′	41°18′ 43°14′	42°13′		
30	33°57′ 51°33′	34°36′ 50°50′	35°15′ 50°7′	35°56′ 49°20′	36°38′ 48°34′	37°21′ 47°45′	38°7′ 46°55′	38°53′ 46°3′	39°43′ 45°9′	40°32′ 44°14′	41°25′ 43°17′	42°18′			
31	34°53′ 50°41′	35°31′ 49°57′	36°11′ 49°13′	36°52′ 48°28′	37°35′ 47°39′	38°20′ 46°52′	39°5′ 46°1′	39°52′ 45°10′	40°41′ 44°15′	41°32′ 43°20′	42°23′				
32	35°46′ 49°50′	36°27′ 49°7′	37°6′ 48°22′	37°48′ 47°36′	38°31′ 46°49′	39°15′ 45°59′	40°1′ 45°9′	40°49′ 44°17′	41°38′ 43°24′	42°28′					
33	36°39′ 48°59′	37°19′ 48°17′	38°0′ 47°32′	38°42′ 46°46′	39°26′ 45°58′	40°0′ 45°8′	40°56′ 44°18′	41°44′ 43°26′	42°33′						
34	37°32′ 48°12′	38°11′ 47°27′	38°53′ 46°43′	39°35′ 45°57′	40°18′ 45°8′	41°4′ 44°20′	41°49′ 43°29′	42°37′							
35	38°22′ 47°24′	39°3′ 46°39′	39°44′ 45°54′	40°26′ 45°8′	41°10′ 44°20′	41°55′ 43°31′	42°41′								
36	39°11′ 46°37′	39°52′ 45°52′	40°34′ 45°8	41°15′ 44°21′	42°0′ 43°34′	42°45′									
37	40°0′ 45°52′	40°40′ 45°8′	41°22′ 44°22′	42°5′ 43°37′	42°48′										
38	40°47′ 45°7′	41°28′ 44°24′	42°9′ 43°39′	42°52′											
39	41°32′ 44°24′	42°14′ 43°40′	42°56′												
40	42°18′ 43°42′	42°58′													
41	43°2′														

TABLE III (Continued).

ANGLE OF FACE-GEAR

PINION	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12
12	20°46′ 61°14′	21°31′ 60°15′	22°18′ 59°10′	23°8′ 58°2′	24°3′ 56°49′	25°2′ 55°32′	26°3′ 54°7′	27°11′ 52°39′	28°25′ 51°3′	29°43′ 49°17′	31°11′ 47°25′	32°44′ 45°24′	34°26′ 43°14′	36°16′ 40°50′	38°17′
13	22°37′ 59°29′	23°26′ 58°28′	24°15′ 57°21′	25°9′ 56°11′	26°6′ 54°56′	27°8′ 53°36′	28°14′ 52°10′	29°25′ 50°39′	30°42′ 49°2′	32°4′ 47°16′	33°34′ 45°22′	35°10′ 43°20′	36°55′ 41°9′	38°48′	
14	24°25′ 57°49′	25°16′ 56°46′	26°8′ 55°38′	27°5′ 54°25′	28°4′ 53°8′	29°9′ 51°47′	30°20′ 50°20′	31°33′ 48°47′	32°52′ 47°8′	34°18′ 45°12′	35°50′ 43°26′	37°28′ 41°24′	39°15′		
15	26°11′ 56°13′	27°3′ 55°7′	27°58′ 53°58′	28°58′ 52°44′	30°0′ 51°26′	31°6′ 50°2′	32°19′ 48°33′	33°36′ 47°0′	34°56′ 45°20′	36°23′ 43°33′	37°57′ 41°39′	39°38′			
16	27°52′ 54°38′	28°45′ 53°31′	29°43′ 52°21′	30°44′ 51°6′	31°50′ 49°46′	32°58′ 48°22′	34°12′ 46°52′	35°31′ 45°19′	36°54′ 43°38′	38°23′ 41°51′	39°57′				
17	29°30′ 53°8′	30°26′ 52°0′	31°26′ 50°48′	32°28′ 49°32′	33°35′ 48°11′	34°47′ 46°47′	36°0′ 45°16′	37°21′ 43°43′	38°45′ 42°1′	40°15′					
18	31°5′ 51°41′	32°2′ 50°32′	33°4′ 49°18′	34°8′ 48°2′	35°15′ 46°41′	36°28′ 45°16′	37°45′ 43°45′	39°5′ 42°11′	40°31′						
19	32°36′ 50°18′	33°36′ 49°8′	34°38′ 47°54′	35°49′ 46°36′	36°53′ 45°15′	38°6′ 43°50′	39°24′ 42°20′	40°45′							
20	34°5′ 48°57′	35°6′ 47°46′	36°8′ 46°32′	37°16′ 45°14′	38°26′ 43°52′	39°39′ 42°27′	40°57′								
21	35°31′ 47°39′	36°32′ 46°28′	37°37′ 45°13′	38°44′ 43°56′	39°34′ 42°34′	41°8′									
22	36°52′ 46°24′	37°55′ 45°13′	39°0′ 43°58′	40°8′ 42°40′	41°19′										
23	38°12′ 45°12′	39°15′ 44°1′	40°20′ 42°46′	41°28′											
24	39°29′ 44°3′	40°32′ 42°52′	41°38′												
25	40°43′ 42°57′	41°46′													
26	41°53′														

$$g_a = 90° - (\alpha + \beta)$$

$$g_b = 90° - (\alpha + \beta)$$

TABLE IV.

ANGLE OF FACE-GEAR

PINION	72	71	70	69	68	67	66	65	64	63	62	61	60	59	58	57
12	7°53′ 78°59′	8° 78°50′	8°7′ 78°39′	8°14′ 78°30′	8°21′ 78°19′	8°28′ 78°10′	8°35′ 77°59′	8°43′ 77°47′	8°51′ 77°37′	8°59′ 77°25′	9°7′ 77°13′	9°17′ 77°1′	9°26′ 76°48′	9°35′ 76°35′	9°45′ 76°23′	9°55′ 76°8′
13	8°40 78°12′	8°48 78°2′	8°54′ 77°52′	9°2′ 77°42′	9°9′ 77°31′	9°18′ 77°20′	9°26′ 77°8′	9°35′ 76°56′	9°43′ 76°45′	9°52′ 76°32′	10°1′ 76°19′	10°11′ 76°7′	10°21′ 75°53′	10°31′ 75°39′	10°42′ 75°26′	10°53′ 75°11′
14	9°26′ 77°26′	9°34′ 77°16′	9°42′ 77°4′	9°50′ 76°54′	9°59′ 76°43′	10°8′ 76°30′	10°16′ 76°18′	10°25 76°7′	10°35′ 75°55′	10°45′ 75°41′	10°54′ 75°28′	11°5′ 75°15′	11°16′ 75°	11°27′ 74°45′	11°39′ 74°31′	11°50′ 74°14′
15	10°12′ 76°40′	10°21′ 76°29′	10°30′ 76°18′	10°38′ 76°6′	10°47′ 75°55′	10°57′ 75°43′	11°6′ 75°30′	11°16′ 75°16′	11°27′ 75°3′	11°37′ 74°49′	11°47′ 74°35′	11°59′ 74°21′	12°11′ 74°7′	12°22′ 73°50′	12°35′ 73°35′	12°48′ 73°18′
16	10°59′ 75°55′	11°7′ 75°43′	11°17′ 75°31′	11°26′ 75°20′	11°37′ 75°7′	11°46′ 74°54′	11°56′ 74°40′	12°7′ 74°27′	12°17′ 74°13′	12°29′ 73°59′	12°40′ 73°44′	12°52′ 73°28′	13°5′ 73°13′	13°18′ 72°56′	13°30′ 72°40′	13°45′ 72°23′
17	11°44′ 75°10′	11°54′ 74°58	12°4′ 74°46′	12°13′ 74°33′	12°24′ 74°20′	12°34′ 74°5′	12°46′ 73°52′	12°56′ 73°38′	13°7′ 73°23′	13°21′ 73°9′	13°32′ 72°52′	13°45′ 72°35′	13°59′ 72°21′	14°11′ 72°3′	14°26′ 71°45′	14°40′ 71°28′
18	12°29′ 74°25′	12°40′ 74°12′	12°50′ 74°	13° 73°46′	13°12′ 73°32′	13°23′ 73°19′	13°34′ 73°4′	13°47′ 72°49′	13°59′ 72°33′	14°12′ 72°18′	14°24′ 72°2′	14°38′ 71°44′	14°52′ 71°28′	15°6′ 71°10′	15°21′ 70°51′	15°36′ 70°34′
19	13°14′ 73°40′	13°25′ 73°27′	13°36′ 73°14′	13°48′ 73°	14° 72°46′	14°11′ 72°31′	14°24′ 72°16	14°36′ 72°	14°49′ 71°45′	15°2′ 71°28′	15°15′ 71°11′	15°30′ 70°54′	15°44′ 70°30′	15°59′ 70°17′	16°15′ 69°59′	16°31′ 69°39′
20	13°59′ 72°57′	14°11′ 72°43′	14°23′ 72°29′	14°34′ 72°14′	14°46′ 72°	15°4′ 71°45′	15°11′ 71°29′	15°25′ 71°13′	15°39′ 70°56′	15°52′ 70°38′	16°7′ 70°21′	16°21′ 70°3′	16°37′ 69°45′	16°53′ 69°25′	17°8′ 69°6′	17°26′ 68°46′
21	14°43′ 72°13′	14°55′ 71°59′	15°8′ 71°44′	15°21′ 71°29′	15°33′ 71°13′	15°46′ 70°58′	15°59′ 70°41′	16°13′ 70°25′	16°28′ 70°8′	16°42′ 69°50′	16°58′ 69°32′	17°13′ 69°13′	17°28′ 68°54′	17°46′ 68°34′	18°2′ 68°14′	18°30′ 67°52′
22	15°27′ 71°29′	15°40′ 71°14′	15°53′ 70°59′	16°6′ 70°44′	16°20′ 70°28′	16°33′ 70°11′	16°47′ 69°55′	17°2′ 69°38′	17°16′ 69°20′	17°31′ 69°1′	17°49 68°43′	18°3′ 68°23′	18°20′ 68°4′	18°37′ 67°43′	18°56′ 67°22′	19°13′ 67°1′
23	16°12′ 70°46′	16°24′ 70°30′	16°38′ 70°16′	16°51′ 69°59′	17°5′ 69°43′	17°20′ 69°26′	17°34′ 69°8′	17°50′ 68°50′	18°5′ 68°33′	18°20′ 68°14′	18°36′ 67°54′	18°54′ 67°34′	19°10′ 67°14′	19°28′ 66°52′	19°48′ 66°32′	20°5′ 66°9′
24	16°55′ 70°3′	17°9′ 69°47′	17°22′ 69°32′	17°37′ 69°15′	17°51′ 68°59′	18°6′ 68°40′	18°21′ 68°23′	18°37′ 68°5′	18°53′ 67°45′	19°9′ 67°27′	19°26′ 67°6′	19°44′ 66°46′	20°1′ 66°25′	20°19′ 66°3′	20°39′ 65°41′	20°58′ 65°18′
25	17°39′ 69°21′	17°52′ 69°4′	18°6′ 68°48′	18°21′ 68°31′	18°36′ 68°14′	18°52′ 67°56′	19°7′ 67°37′	19°24′ 67°18′	19°40′ 67°	19°57′ 66°39′	20°14′ 66°20′	20°32′ 65°58′	20°51′ 65°37′	21°10′ 65°14′	21°29′ 64°51′	21°50′ 64°28′
26	18°21′ 68°39′	18°36′ 68°22′	18°51′ 68°5′	19°6′ 67°48′	19°22′ 67°30′	19°37′ 67°13′	19°53′ 66°53′	20°10′ 66°34′	20°26′ 66°14′	20°45′ 65°53′	21°2′ 65°32′	21°21′ 65°11′	21°41′ 64°49′	22° 64°26′	22°20′ 64°2′	22°41′ 63°39′
27	19°3′ 67°57′	19°19′ 67°39′	19°34′ 67°22′	19°49′ 67°5′	20°6′ 66°46′	20°22′ 66°28′	20°38′ 66°8′	20°56′ 65°48′	21°13′ 65°29′	21°32′ 65°8′	21°50′ 64°46′	22°10′ 64°24′	22°29′ 64°1′	22°49′ 63°39′	23°10′ 63°14′	23°31′ 62°49′
28	19°46′ 67°16′	20°1′ 66°59′	20°17′ 66°41′	20°32′ 66°22′	20°50′ 66°4′	21°6′ 65°44′	21°23′ 65°25′	21°41′ 65°5′	22° 64°44	22°18′ 64°22′	22°37′ 64°1′	22°56′ 63°38′	23°17′ 63°15′	23°38′ 62°52′	23°59′ 62°27′	24°21′ 62°1′
29	20°27′ 66°35′	20°43′ 66°17′	20°59′ 65°59′	21°16′ 65°40′	21°33′ 65°21′	21°50′ 65°2′	22°8′ 64°42′	22°27′ 64°21′	22°45′ 63°59′	23°5′ 63°37′	23°25′ 63°15′	23°44′ 62°52′	24°4′ 62°28′	24°25′ 62°5′	24°48′ 61°40′	25°10′ 61°14′
30	21°9′ 65°55′	21°25′ 65°37′	21°42′ 65°18′	21°58′ 64°58′	22°15′ 64°39′	22°34′ 64°18′	22°52′ 63°58′	23°10′ 63°38′	23°30′ 63°16′	23°50′ 62°54′	24°10′ 62°30′	24°30′ 62°7′	24°51′ 61°43′	25°12′ 61°18′	25°36′ 60°54′	25°59′ 60°27′
31	21°50′ 65°14′	22°6′ 64°56′	22°24′ 64°36′	22°41′ 64°17′	22°59′ 63°57′	23°17′ 63°37′	23°35′ 63°15′	23°55′ 62°55′	24°14′ 62°32′	24°34′ 62°10′	24°54′ 61°46′	25°17′ 61°23′	25°38′ 60°58′	25°58′ 60°34′	26°22′ 60°8′	26°46′ 59°42′
32	22°31′ 64°35′	22°48′ 64°16′	23°4′ 63°56′	23°23′ 63°37′	23°40′ 63°16′	23°59′ 62°55′	24°18′ 62°34′	24°38′ 62°12′	24°58′ 61°50′	25°18′ 61°26′	25°39′ 61°3′	26°1′ 60°39′	26°23′ 60°15′	26°45′ 59°49′	27°9′ 59°23′	27°34′ 58°56′
33	23°10′ 63°56′	23°28′ 63°36′	23°46′ 63°16′	24°4′ 62°56′	24°22′ 62°36′	24°41′ 62°15′	25°1′ 61°53′	25°21′ 61°31′	25°42′ 61°8′	26°2′ 60°44′	26°24′ 60°20′	26°45′ 59°55′	27°9′ 59°31′	27°31′ 59°5′	27°56′ 58°38′	28°19′ 58°11′
34	23°51′ 63°17′	24°8′ 62°58′	24°27′ 62°37′	24°44′ 62°16′	25°4′ 61°56′	25°23′ 61°33′	25°42′ 61°12′	26°3′ 60°49′	26°24′ 60°26′	26°46′ 60°2′	27°7′ 59°37′	27°29′ 59°13′	27°52′ 58°48′	28°16′ 58°22′	28°40′ 57°54′	29°5′ 57°27′
35	24°29′ 62°39′	24°48′ 62°18′	25°6′ 61°58′	25°25′ 61°37′	25°44′ 61°16′	26°4′ 60°54′	26°24′ 60°32′	26°45′ 60°9′	27°6′ 59°44′	27°28′ 59°22′	27°50′ 58°56′	28°13′ 58°31′	28°36′ 58°6′	29°1′ 57°39′	29°25′ 57°11′	29°50′ 56°44′
36	25°9′ 62°1′	25°27′ 61°41′	25°45′ 61°20′	26°5′ 60°59′	26°24′ 60°36′	26°45′ 60°15′	27°5′ 59°51′	27°26′ 59°28′	27°48′ 59°4′	28°10′ 58°40′	28°33′ 58°15′	28°56′ 57°50′	29°20′ 57°24′	29°43′ 56°57′	30°9′ 56°29′	30°35′ 56°1′
37	25°47′ 61°23′	26°6′ 61°2′	26°25′ 60°41′	26°44′ 60°20′	27°4′ 59°58′	27°25′ 59°35′	27°45′ 59°13′	28°7′ 58°49′	28°29′ 58°25′	28°51′ 58°1′	29°15′ 57°35′	29°38′ 57°10′	30°2′ 56°42′	30°27′ 56°15′	30°52′ 55°48′	31°18′ 55°20′
38	26°25′ 60°47′	26°44′ 60°26′	27°4′ 60°4′	27°24′ 59°42′	27°44′ 59°20′	28°4′ 58°56′	28°26′ 58°34′	28°47′ 58°9′	29°9′ 57°45′	29°33′ 57°21′	29°55′ 56°55′	30°20′ 56°30′	30°44′ 56°2′	31°9′ 55°35′	31°35′ 55°7′	32°1′ 54°39′
39	27°3′ 60°9′	27°22′ 59°48′	27°42′ 59°28′	28°2′ 59°4′	28°22′ 58°42′	28°43′ 58°19′	29°5′ 57°55′	29°27′ 57°31′	29°49′ 57°7′	30°13′ 56°41′	30°36′ 56°16′	31°1′ 55°49′	31°26′ 55°22′	31°50′ 54°54′	32°16′ 54°28′	32°43′ 53°57′
40	27°40′ 59°34′	28°2′ 59°14′	28°20′ 58°50′	28°41′ 58°27′	29°1′ 58°5′	29°22′ 57°42′	29°43′ 57°17′	30°6′ 56°54′	30°28′ 56°28′	30°52′ 56°2′	31°17′ 55°37′	31°42′ 55°10′	32°6′ 54°44′	32°31′ 54°15′	32°57′ 53°46′	33°24′ 53°18′
41	28°17′ 58°57′	28°37′ 58°37′	28°57′ 58°15′	29°18′ 57°52′	29°39′ 57°29′	30°1′ 57°4′	30°22′ 56°40′	30°45′ 56°15′	31°9′ 55°51′	31°31′ 55°25′	31°55′ 54°59′	32°20′ 54°32′	32°46′ 54°4′	33°12′ 53°36′	33°39′ 53°7′	34°5′ 52°38′
42	28°52′ 58°22′	29°12′ 58°1′	29°33′ 57°39′	29°55′ 57°15′	30°16′ 56°52′	30°38′ 56°28′	31° 56°4′	31°23′ 55°39′	31°47′ 55°13′	32°10′ 54°48′	32°35′ 54°21′	33° 53°54′	33°26′ 53°26′	33°52′ 52°58′	34°19′ 52°29′	34°46′ 52°

TABLE IV (Continued).

ANGLE OF FACE-GEAR

PINION	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42
12	10°6′ 75°54′	10°16′ 75°40′	10°28′ 75°24′	10°39′ 75°9′	10°52′ 74°52′	11°3′ 74°37′	11°15′ 74°15′	11°30′ 73°58′	11°43′ 73°39′	11°58′ 73°20′	12°13′ 72°59′	12°29′ 72°37′	12°45′ 72°15′	13°1′ 71°51′	13°19′ 71°25′
13	11°4′ 74°56′	11°16′ 74°40′	11°28′ 74°24′	11°42′ 74°8′	11°54′ 73°50′	12°8′ 73°32′	12°20′ 73°12′	12°37′ 72°53′	12°51′ 72°33′	13°7′ 72°11′	13°23′ 71°49′	13°40′ 71°26′	13°58′ 71°2′	14°10′ 70°38′	14°35′ 70°11′
14	12°2′ 73°58′	12°16′ 73°42′	12°29′ 73°25′	12°43′ 73°7′	12°57′ 72°49′	13°11′ 72°29′	13°26′ 72°8′	13°42′ 71°48′	13°59′ 71°27′	14°15′ 71°5′	14°33′ 70°41′	14°51′ 70°17′	15°10′ 69°52′	15°30′ 69°26′	15°51′ 68°59′
15	13°1′ 73°1′	13°16′ 72°44′	13°28′ 72°26′	13°43′ 72°7′	13°59′ 71°49′	14°14′ 71°28′	14°30′ 71°6′	14°47′ 70°45′	15°5′ 70°23′	15°23′ 69°59′	15°42′ 69°34′	16°1′ 69°9′	16°22′ 68°42′	16°43′ 68°15′	17°5′ 67°47′
16	13°59′ 72°5′	14°13′ 71°47′	14°28′ 71°28′	14°44′ 71°8′	15°1′ 70°49′	15°17′ 70°27′	15°35′ 70°5′	15°52′ 69°42′	16°11′ 69°19′	16°30′ 68°54′	16°50′ 68°28′	17°10′ 68°2′	17°32′ 67°34′	17°56′ 67°6′	18°18′ 66°36′
17	14°57′ 71°9′	15°11′ 70°49′	15°28′ 70°30′	15°44′ 70°10′	16°1′ 69°49′	16°18′ 69°26′	16°37′ 69°3′	16°55′ 68°39′	17°15′ 68°15′	17°36′ 67°50′	17°57′ 67°23′	18°20′ 66°54′	18°43′ 66°27′	19°6′ 65°58′	19°31′ 65°27′
18	15°52′ 70°14′	16°7′ 69°53′	16°26′ 69°34′	16°42′ 69°12′	17°1′ 68°49′	17°20′ 68°26′	17°39′ 68°3′	17°58′ 67°38′	18°20′ 67°12″	18°41′ 66°47	19°3′ 66°19′	19°27′ 65°51′	19°50′ 65°20′	20°18′ 64°50′	20°42 64°18
19	16°49′ 69°19′	17°2′ 68°58′	17°23′ 68°37′	17°41′ 68°15′	18° 67°52′	18°21′ 67°29′	18°40′ 67°4′	19°1′ 66°37′	19°22′ 66°12′	19°46′ 65°44	20°8′ 65°16′	20°34′ 64°46′	20°59′ 64°15′	21°24′ 63°44′	21°52′ 63°10′
20	17°44′ 68°26′	18°1′ 68°3′	18°19′ 67°41′	18°40′ 67°18′	19° 66°54′	19°20′ 66°30′	19°41′ 66°5′	20°2′ 65°38′	20°25′ 65°11′	20°49′ 64°43′	21°13′ 64°13′	21°39′ 63°43′	22°5′ 63°11′	22°32′ 62°38′	23° 62°4′
21	18°39′ 67°31′	18°57′ 67°9′	19°16′ 66°46′	19°37′ 66°23′	19°58′ 65°58′	20°19′ 65°33′	20°41′ 65°7′	21°3′ 64°39′	21°27′ 64°11′	21°52′ 63°42′	22°17′ 63°13′	22°43′ 62°41′	23°10′ 62°8′	23°38′ 61°34′	24°8′ 61°
22	19°32′ 66°38′	19°52′ 66°16′	20°12′ 65°52′	20°33′ 65°27′	20°55′ 65°3′	21°17′ 64°37′	21°40′ 64°10′	22°3′ 63°41′	22°17′ 63°13′	22°53′ 62°43′	23°19′ 62°11′	23°46′ 61°40′	24°15′ 61°7′	24°44′ 60°32′	25°14′ 59°56′
23	20°25′ 65°47′	20°47′ 65°23′	21°8′ 64°58′	21°29′ 64°33′	21°52′ 64°8′	22°13 63°41′	22°37′ 63°13′	23°2′ 62°44′	23°27′ 62°15′	23°54′ 61°44′	24°21′ 61°13′	24°49′ 60°41′	25°18′ 60°6′	25°47′ 59°31′	26°18′ 58°54′
24	21°19′ 64°55′	21°39′ 64°31′	22°1′ 64°5′	22°24′ 63°40′	22°46′ 63°14′	23°10′ 62°46′	23°36′ 62°19′	24° 61°48′	24°26′ 61°18′	24°53′ 60°47′	25°21′ 60°15′	25°49′ 59°41′	26°20′ 59°6′	26°51′ 58°31′	27°23′ 57°53′
25	22°11′ 64°5′	22°33′ 63°39′	22°56′ 63°14′	23°18′ 62°48′	23°41′ 62°21′	24°7′ 61°53′	24°32′ 61°24′	24°57′ 60°53′	25°24′ 60°22′	25°52′ 59°50′	26°20′ 59°18′	26°50′ 58°44′	27°21′ 58°9′	27°52′ 57°32′	28°26′ 56°54′
26	23°3′ 63°15′	23°25′ 62°49′	23°47′ 62°23′	24°13′ 61°56′	24°36′ 61°28′	25°1′ 60°59′	25°28′ 60°30′	25°53′ 59°59′	26°21′ 59°27′	26°49′ 58°55′	27°19′ 58°21′	27°49′ 57°47′	28°21′ 57°11′	28°54′ 56°34′	29°27′ 55°55′
27	23°53′ 62°25′	24°16′ 61°58′	24°40′ 61°32′	25°5′ 61°5′	25°29′ 60°37′	25°55′ 60°7′	26°22′ 59°38′	26°48′ 59°5′	27°17′ 58°33′	27°46′ 58°	28°16′ 57°26′	28°47′ 56°51′	29°19′ 56°15′	29°52′ 55°38′	30°27′ 54°59′
28	24°44′ 61°36′	25°7′ 61°9′	25°31′ 60°43′	25°56′ 60°14′	26°22′ 59°46′	26°48′ 59°16′	27°15′ 58°45′	27°43′ 58°13′	28°12′ 57°42′	28°42′ 57°8′	29°12′ 56°32′	29°43′ 55°57′	30°16′ 55°20′	30°50′ 54°42′	31°25′ 54°3′
29	25°33′ 60°47′	25°57′ 60°21′	26°22′ 59°52′	26°47′ 59°25′	27°14′ 58°56′	27°40′ 58°26′	28°8′ 57°54′	28°36′ 57°22′	29°5′ 56°49′	29°37′ 56°15′	30°8′ 55°40′	30°40′ 55°4′	31°13′ 54°27′	31°48′ 53°48′	32°23′ 53°9′
30	26°22′ 60°	26°47′ 59°33′	27°12′ 59°6′	27°38′ 58°36′	28°4′ 58°6′	28°32′ 57°36′	29° 57°4′	29°28′ 56°32′	29°58′ 55°58′	30°30′ 55°24′	31°2′ 54°48′	31°34′ 54°12′	32°8′ 53°34′	32°44′ 52°54′	33°19′ 52°15′
31	27°10′ 59°14′	27°34′ 58°46′	28°3′ 58°15′	28°27′ 57°49′	28°54′ 57°18′	29°23′ 56°47′	29°51′ 56°15′	30°20′ 55°42′	30°52′ 55°8′	31°22′ 54°34′	31°55′ 53°57′	32°29′ 53°21′	33°2′ 52°42′	33°39′ 52°3′	34°15′ 51°23′
32	27°58′ 58°28′	28°23′ 57°59′	28°49′ 57°31′	29°17′ 57°1′	29°33′ 56°41′	30°12′ 56°	30°42′ 55°28′	31°10′ 54°54′	31°42′ 54°20′	32°14′ 53°44′	32°46′ 53°8′	33°21′ 52°31′	33°56′ 51°52′	34°31′ 51°13′	35°8′ 50°32′
33	28°45′ 57°43′	29°10′ 57°14′	29°37′ 56°45′	30°5′ 56°15′	30°32′ 55°49′	31°1′ 55°13′	31°31′ 54°39′	32°1′ 54°5′	32°32′ 53°32′	33°4′ 52°56′	33°38′ 52°20′	34°12′ 51°42′	34°47′ 51°3′	35°24′ 50°22′	36° 49°41′
34	29°31′ 56°59′	29°57′ 56°29′	30°24 56°	30°51′ 55°29′	31°20′ 54°58′	31°49′ 54°27′	32°19′ 53°53′	32°50′ 53°20′	33°22′ 52°44′	33°54′ 52°8′	34°28′ 51°32′	35°6′ 50°50′	35°38′ 50°14′	36°15′ 49°35′	36°53′ 48°53′
35	30°15′ 56°15′	30°42′ 55°46′	31°10′ 55°16′	31°38′ 54°44′	32°7′ 54°13′	32°36′ 53°40′	33°7′ 53°7′	33°38′ 52°34′	34°10′ 51°58′	34°42′ 51°22′	35°17′ 50°45′	35°51′ 50°7′	36°27′ 49°27′	37°5′ 48°47′	37°42′ 48°6′
36	31° 55°32′	31°27′ 55°3′	31°55′ 54°33′	32°23′ 54°1′	32°53′ 53°28′	33°23′ 52°57′	33°53′ 52°23′	34°25′ 51°40′	34°57′ 51°13′	35°31′ 50°37′	36°5′ 49°59′	36°41′ 49°21′	37°16′ 48°42′	37°53′ 48°1′	38°32′ 47°20′
37	31°45′ 54°49′	32°12′ 54°20′	32°40′ 53°50′	33°8′ 53°18′	33°38′ 52°46′	34°9′ 52°13′	34°40′ 51°40′	35°12′ 51°4′	35°43′ 50°29′	36°18′ 49°52′	36°51′ 49°15′	37°27′ 48°37′	38°4′ 47°56′	38°42′ 47°16′	39°20′ 46°34′
38	32°27′ 54°9′	32°56′ 53°38′	33°24′ 53°8′	33°52′ 52°38′	34°22′ 52°4′	34°54′ 51°30′	35°24′ 50°56′	35°57′ 50°21′	36°29′ 49°45′	37°3′ 49°9′	37°38′ 48°32′	38°14′ 47°52′	38°51′ 47°13′	39°28′ 46°32′	40°7′ 45°51′
39	33°10′ 53°28′	33°39′ 52°57′	34°7′ 52°27′	34°36′ 51°54′	35°7′ 51°21′	35°37′ 50°49′	36°9′ 50°15′	36°41′ 49°39′	37°15′ 49°3′	37°48′ 48°26′	38°24′ 47°48′	39° 47°10′	39°36′ 46°30′	40°13′ 45°49′	40°53′ 45°7′
40	33°52′ 52°48′	34°21′ 52°17′	34°50′ 51°46′	35°18′ 51°14′	35°49′ 50°41′	36°20′ 50°8′	36°53′ 49°33′	37°25′ 48°57′	37°58′ 48°22′	38°33′ 47°45′	39°8′ 47°6′	39°44′ 46°28′	40°20′ 45°48′	40°58′ 45°8′	41°37′ 44°25′
41	34°33′ 52°9′	35°3′ 51°37′	35°31′ 51°7′	36°1′ 50°33′	36°31′ 50°1′	37°3′ 49°27′	37°35′ 48°53′	38°7′ 48°17′	38°41′ 47°41′	39°16′ 47°4′	39°51′ 46°25′	40°27′ 45°47′	41°5′ 45°7′	41°42′ 44°26′	41°22′ 43°44′
42	35°14′ 51°30′	35°43′ 50°59′	36°12′ 50°28′	36°42′ 49°54′	37°13′ 49°21′	37°44′ 48°48′	38°17′ 48°13′	38°49′ 47°37′	39°23′ 47°1′	39°58′ 46°24′	40°34′ 45°46′	41°9′ 45°7′	41°47′ 44°27′	42°26′ 43°46′	43°4′

Table for Selecting Cutters for Bevel Gears

CUTTERS FOR USE IN CUTTING BEVEL GEARS.

PINION.

GEAR.

	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
12	7-7																		
13	6-7	6-6																	
14	5-7	6-6	6-6																
15	5-7	5-6	5-6	5-5															
16	4-7	5-7	5-6	5-6	5-5														
17	4-7	4-7	4-6	5-6	5-5	5-5													
18	4-7	4-7	4-6	4-6	4-5	4-5	5-5												
19	3-7	4-7	4-6	4 6	4-6	4-5	4-5	4-4											
20	3-7	3-7	4-6	4-6	4-6	4-5	4-5	4-4	4-4										
21	3-8	3-7	3-7	3-6	4-6	4-5	4-5	4-5	4-4	4-4									
22	3-8	3-7	3-7	3-6	3-6	3-5	4-5	4-5	4-4	4-4	4-4								
23	3-8	3-7	3-7	3-6	3-6	3-5	3-5	3-5	3-4	4-4	4-4	4-4							
24	3-8	3-7	3-7	3-6	3-6	3-6	3-5	3-5	3-4	3-4	3-4	4-4	4-4						
25	2-8	2-7	3-7	3-6	3-6	3-6	3-5	3-5	3-5	3-4	3-4	3-4	4-4	3-3					
26	2-8	2-7	3-7	3-6	3-6	3-6	3-5	3-5	3-5	3-4	3-4	3-4	3-4	3-3	3-3				
27	2-8	2-7	2-7	2-6	3-6	3-6	3-5	3-5	3-5	3-4	3-4	3-4	3-4	3-4	3-3	3-3			
28	2-8	2-7	2-7	2-6	2-6	3-6	3-5	3-5	3-5	3-4	3-4	3-4	3-4	3-4	3-3	3-3	3-3		
29	2-8	2-7	2-7	2-7	2-6	2-6	3-5	3-5	3-5	3-4	3-4	3-4	3-4	3-4	3-3	3-3	3-3	3-3	
30	2-8	2-7	2-7	2-7	2-6	2-6	2-5	2-5	3-5	3-5	3-4	3-4	3-4	3-4	3-4	3-3	3-3	3-3	3-3
31	2-8	2-7	2-7	2-7	2-6	2-6	2-6	2-5	2-5	2-5	3-4	3-4	3-4	3-4	3-4	3-3	3-3	3-3	3-3
32	2-8	2-7	2-7	2-7	2-6	2-6	2-6	2-5	2-5	2-5	2-4	2-4	3-4	3-4	3-4	3-3	3-3	3-3	3-3
33	2-8	2-8	2-7	2-7	2-6	2-6	2-6	2-5	2-5	2-5	2-4	2-4	2-4	3-4	3-4	3-4	3-3	3-3	3-3
34	2-8	2-8	2-7	2-7	2-6	2-6	2-6	2-5	2-5	2-5	2-4	2-4	2-4	2-4	2-4	3-4	3-3	3-3	3-3
35	2-8	2-8	2-7	2-7	2-6	2-6	2-6	2-5	2-5	2-5	2-4	2-4	2-4	2-4	2-4	2-4	2-3	3-3	3-3
36	2-8	2-8	2-7	2-7	2-6	2-6	2-6	2-5	2-5	2-5	2-5	2-4	2-4	2-4	2-4	2-4	2-3	2-3	2-3
37	2-8	2-8	2-7	2-7	2-6	2-6	2-6	2-5	2-5	2-5	2-5	2-4	2-4	2-4	2-4	2-4	2-3	2-3	2-3
38	2-8	2-8	2-7	2-7	2-6	2-6	2-6	2-5	2-5	2-5	2-5	2-4	2-4	2-4	2-4	2-4	2-4	2-3	2-3
39	2-8	2-8	2-7	2-7	2-6	2-6	2-6	2-5	2-5	2-5	2-5	2-4	2-4	2-4	2-4	2-4	2-4	2-3	2-3
40	1-8	2-8	2-7	2-7	2-6	2-6	2-6	2-5	2-5	2-5	2-5	2-4	2-4	2-4	2-4	2-4	2-4	2-3	2-3
41	1-8	1-8	2-7	2-7	2-6	2-6	2-6	2-6	2-5	2-5	2-5	2-4	2-4	2-4	2-4	2-4	2-4	2-3	2-3
42	1-8	1-8	2-7	2-7	2-6	2-6	2-6	2-6	2-5	2-5	2-5	2-5	2-4	2-4	2-4	2-4	2-4	2-3	2-3
43	1-8	1-8	1-7	2-7	2-6	2-6	2-6	2-6	2-5	2-5	2-5	2-5	2-4	2-4	2-4	2-4	2-4	2-4	2-3
44	1-8	1-8	1-7	1-7	2-6	2-6	2-6	2-6	2-5	2-5	2-5	2-5	2-4	2-4	2-4	2-4	2-4	2-4	2-3
45	1-8	1-8	1-7	1-7	1-6	2-6	2-6	2-6	2-5	2-5	2-5	2-5	2-4	2-4	2-4	2-4	2-4	2-4	2-3
46	1-8	1-8	1-7	1-7	1-7	2-6	2-6	2-6	2-5	2-5	2-5	2-5	2-4	2-4	2-4	2-4	2-4	2-4	2-3
47	1-8	1-8	1-7	1-7	1-7	1-6	2-6	2-6	2-5	2-5	2-5	2-5	2-4	2-4	2-4	2-4	2-4	2-4	2-3
48	1-8	1-8	1-7	1-7	1-7	1-6	1-6	2-6	2-5	2-5	2-5	2-5	2-4	2-4	2-4	2-4	2-4	2-4	2-3
49	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	2-5	2-5	2-5	2-5	2-4	2-4	2-4	2-4	2-4	2-4	2-3
50	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	2-5	2-5	2-5	2-5	2-4	2-4	2-4	2-4	2-4	2-4	2-3
51	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-5	2-5	2-5	2-5	2-4	2-4	2-4	2-4	2-4	2-4	2-4
52	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-5	1-5	2-5	2-5	2-4	2-4	2-4	2-4	2-4	2-4	2-4
53	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-5	1-5	1-5	2-5	2-4	2-4	2-4	2-4	2-4	2-4	2-4
54	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-5	1-5	1-5	1-5	2-4	2-4	2-4	2-4	2-4	2-4	2-4
55	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	2-4	2-4	2-4	2-4	2-4	2-4

CUTTERS FOR USE IN CUTTING BEVEL GEARS.

(Continued.)

PINION.

GEAR.	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
56	1-8	1-8	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	2-4	2-4	2-4	2-4	2-4
57	1-8	1-8	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	2-4	2-4	2-4	2-4
58	1-8	1-8	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	2-4	2-4	2-4
59	1-8	1-8	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	2-4	2-4
60	1-8	1-8	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	2-4
61	1-8	1-8	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
62	1-8	1-8	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
63	1-8	1-8	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
64	1-8	1-8	1-7	1-7	1-6	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
65	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
66	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
67	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
68	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
69	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
70	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
71	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
72	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
73	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
74	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
75	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
76	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
77	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
78	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
79	1-8	1-8	1 7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
80	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
81	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
82	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
83	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
84	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
85	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
86	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
87	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1 6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
88	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
89	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
90	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
91	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
92	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
93	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
94	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
95	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
96	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
97	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
98	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
99	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4
100	1-8	1-8	1-7	1-7	1-7	1-6	1-6	1-6	1-6	1-5	1-5	1-5	1-5	1-4	1-4	1-4	1-4	1-4	1-4

Natural Sines and Cosines

Natural Tangents and Cotangents

NATURAL SINES AND COSINES

′	0° Sine	0° Cosine	1° Sine	1° Cosine	2° Sine	2° Cosine	3° Sine	3° Cosine	4° Sine	4° Cosine	′
0	.00000	1.	.01745	.99985	.03490	.99939	.05234	.99863	.06976	.99756	60
1	.00029	1.	.01774	.99984	.03519	.99938	.05263	.99861	.07005	.99754	59
2	.00058	1.	.01803	.99984	.03548	.99937	.05292	.99860	.07034	.99752	58
3	.00087	1.	.01832	.99983	.03577	.99936	.05321	.99858	.07063	.99750	57
4	.00116	1.	.01862	.99983	.03606	.99935	.05350	.99857	.07092	.99748	56
5	.00145	1.	.01891	.99982	.03635	.99934	.05379	.99855	.07121	.99746	55
6	.00175	1.	.01920	.99982	.03664	.99933	.05408	.99854	.07150	.99744	54
7	.00204	1.	.01949	.99981	.03693	.99932	.05437	.99852	.07179	.99742	53
8	.00233	1.	.01978	.99980	.03723	.99931	.05466	.99851	.07208	.99740	52
9	.00262	1.	.02007	.99980	.03752	.99930	.05495	.99849	.07237	.99738	51
10	.00291	1.	.02036	.99979	.03781	.99929	.05524	.99847	.07266	.99736	50
11	.00320	.99999	.02065	.99979	.03810	.99927	.05553	.99846	.07295	.99734	49
12	.00349	.99999	.02094	.99978	.03839	.99926	.05582	.99844	.07324	.99731	48
13	.00378	.99999	.02123	.99977	.03868	.99925	.05611	.99842	.07353	.99729	47
14	.00407	.99999	.02152	.99977	.03897	.99924	.05640	.99841	.07382	.99727	46
15	.00436	.99999	.02181	.99976	.03926	.99923	.05669	.99839	.07411	.99725	45
16	.00465	.99999	.02211	.99976	.03955	.99922	.05698	.99838	.07440	.99723	44
17	.00495	.99999	.02240	.99975	.03984	.99921	.05727	.99836	.07469	.99721	43
18	.00524	.99999	.02269	.99974	.04013	.99919	.05756	.99834	.07498	.99719	42
19	.00553	.99998	.02298	.99974	.04042	.99918	.05785	.99833	.07527	.99716	41
20	.00582	.99998	.02327	.99973	.04071	.99917	.05814	.99831	.07556	.99714	40
21	.00611	.99998	.02356	.99972	.04100	.99916	.05844	.99829	.07585	.99712	39
22	.00640	.99998	.02385	.99972	.04129	.99915	.05873	.99827	.07614	.99710	38
23	.00669	.99998	.02414	.99971	.04159	.99913	.05902	.99826	.07643	.99708	37
24	.00698	.99998	.02443	.99970	.04188	.99912	.05931	.99824	.07672	.99705	36
25	.00727	.99997	.02472	.99969	.04217	.99911	.05960	.99822	.07701	.99703	35
26	.00756	.99997	.02501	.99969	.04246	.99910	.05989	.99821	.07730	.99701	34
27	.00785	.99997	.02530	.99968	.04275	.99909	.06018	.99819	.07759	.99699	33
28	.00814	.99997	.02560	.99967	.04304	.99907	.06047	.99817	.07788	.99696	32
29	.00844	.99996	.02589	.99966	.04333	.99906	.06076	.99815	.07817	.99694	31
30	.00873	.99996	.02618	.99966	.04362	.99905	.06105	.99813	.07846	.99692	30
31	.00902	.99996	.02647	.99965	.04391	.99904	.06134	.99812	.07875	.99689	29
32	.00931	.99996	.02676	.99964	.04420	.99902	.06163	.99810	.07904	.99687	28
33	.00960	.99995	.02705	.99963	.04449	.99901	.06192	.99808	.07933	.99685	27
34	.00989	.99995	.02734	.99963	.04478	.99900	.06221	.99806	.07962	.99683	26
35	.01018	.99995	.02763	.99962	.04507	.99898	.06250	.99804	.07991	.99680	25
36	.01047	.99995	.02792	.99961	.04536	.99897	.06279	.99803	.08020	.99678	24
37	.01076	.99994	.02821	.99960	.04565	.99896	.06308	.99801	.08049	.99676	23
38	.01105	.99994	.02850	.99959	.04594	.99894	.06337	.99799	.08078	.99673	22
39	.01134	.99994	.02879	.99959	.04623	.99893	.06366	.99797	.08107	.99671	21
40	.01164	.99993	.02908	.99958	.04653	.99892	.06395	.99795	.08136	.99668	20
41	.01193	.99993	.02938	.99957	.04682	.99890	.06424	.99793	.08165	.99666	19
42	.01222	.99993	.02967	.99956	.04711	.99889	.06453	.99792	.08194	.99664	18
43	.01251	.99992	.02996	.99955	.04740	.99888	.06482	.99790	.08223	.99661	17
44	.01280	.99992	.03025	.99954	.04769	.99886	.06511	.99788	.08252	.99659	16
45	.01309	.99991	.03054	.99953	.04798	.99885	.06540	.99786	.08281	.99657	15
46	.01338	.99991	.03083	.99952	.04827	.99883	.06569	.99784	.08310	.99654	14
47	.01367	.99991	.03112	.99952	.04856	.99882	.06598	.99782	.08339	.99652	13
48	.01396	.99990	.03141	.99951	.04885	.99881	.06627	.99780	.08368	.99649	12
49	.01425	.99990	.03170	.99950	.04914	.99879	.06656	.99778	.08397	.99647	11
50	.01454	.99989	.03199	.99949	.04943	.99878	.06685	.99776	.08426	.99644	10
51	.01483	.99989	.03228	.99948	.04972	.99876	.06714	.99774	.08455	.99642	9
52	.01513	.99989	.03257	.99947	.05001	.99875	.06743	.99772	.08484	.99639	8
53	.01542	.99988	.03286	.99946	.05030	.99873	.06773	.99770	.08513	.99637	7
54	.01571	.99988	.03316	.99945	.05059	.99872	.06802	.99768	.08542	.99635	6
55	.01600	.99987	.03345	.99944	.05088	.99870	.06831	.99766	.08571	.99632	5
56	.01629	.99987	.03374	.99943	.05117	.99869	.06860	.99764	.08600	.99630	4
57	.01658	.99986	.03403	.99942	.05146	.99867	.06889	.99762	.08629	.99627	3
58	.01687	.99986	.03432	.99941	.05175	.99866	.06918	.99760	.08658	.99625	2
59	.01716	.99985	.03461	.99940	.05205	.99864	.06947	.99758	.08687	.99622	1
60	.01745	.99985	.03490	.99939	.05234	.99863	.06976	.99756	.08716	.99619	0
′	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	′
	89°		88°		87°		86°		85°		

NATURAL SINES AND COSINES

′	5° Sine	5° Cosine	6° Sine	6° Cosine	7° Sine	7° Cosine	8° Sine	8° Cosine	9° Sine	9° Cosine	′
0	.08716	.99619	.10453	.99452	.12187	.99255	.13917	.99027	.15643	.98769	60
1	.08745	.99617	.10482	.99449	.12216	.99251	.13946	.99023	.15672	.98764	59
2	.08774	.99614	.10511	.99446	.12245	.99248	.13975	.99019	.15701	.98760	58
3	.08803	.99612	.10540	.99443	.12274	.99244	.14004	.99015	.15730	.98755	57
4	.08831	.99609	.10569	.99440	.12302	.99240	.14033	.99011	.15758	.98751	56
5	.08860	.99607	.10597	.99437	.12331	.99237	.14061	.99006	.15787	.98746	55
6	.08889	.99604	.10626	.99434	.12360	.99233	.14090	.99002	.15816	.98741	54
7	.08918	.99602	.10655	.99431	.12389	.99230	.14119	.98998	.15845	.98737	53
8	.08947	.99599	.10684	.99428	.12418	.99226	.14148	.98994	.15873	.98732	52
9	.08976	.99596	.10713	.99424	.12447	.99222	.14177	.98990	.15902	.98728	51
10	.09005	.99594	.10742	.99421	.12476	.99219	.14205	.98986	.15931	.98723	50
11	.09034	.99591	.10771	.99418	.12504	.99215	.14234	.98982	.15959	.98718	49
12	.09063	.99588	.10800	.99415	.12533	.99211	.14263	.98978	.15988	.98714	48
13	.09092	.99586	.10829	.99412	.12562	.99208	.14292	.98973	.16017	.98709	47
14	.09121	.99583	.10858	.99409	.12591	.99204	.14320	.98969	.16046	.98704	46
15	.09150	.99580	.10887	.99406	.12620	.99200	.14349	.98965	.16074	.98700	45
16	.09179	.99578	.10916	.99402	.12649	.99197	.14378	.98961	.16103	.98695	44
17	.09208	.99575	.10945	.99399	.12678	.99193	.14407	.98957	.16132	.98690	43
18	.09237	.99572	.10973	.99396	.12706	.99189	.14436	.98953	.16160	.98686	42
19	.09266	.99570	.11002	.99393	.12735	.99186	.14464	.98948	.16189	.98681	41
20	.09295	.99567	.11031	.99390	.12764	.99182	.14493	.98944	.16218	.98676	40
21	.09324	.99564	.11060	.99386	.12793	.99178	.14522	.98940	.16246	.98671	39
22	.09353	.99562	.11089	.99383	.12822	.99175	.14551	.98936	.16275	.98667	38
23	.09382	.99559	.11118	.99380	.12851	.99171	.14580	.98931	.16304	.98662	37
24	.09411	.99556	.11147	.99377	.12880	.99167	.14608	.98927	.16333	.98657	36
25	.09440	.99553	.11176	.99374	.12908	.99163	.14637	.98923	.16361	.98652	35
26	.09469	.99551	.11205	.99370	.12937	.99160	.14666	.98919	.16390	.98648	34
27	.09498	.99548	.11234	.99367	.12966	.99156	.14695	.98914	.16419	.98643	33
28	.09527	.99545	.11263	.99364	.12995	.99152	.14723	.98910	.16447	.98638	32
29	.09556	.99542	.11291	.99360	.13024	.99148	.14752	.98906	.16476	.98633	31
30	.09585	.99540	.11320	.99357	.13053	.99144	.14781	.98902	.16505	.98629	30
31	.09614	.99537	.11349	.99354	.13081	.99141	.14810	.98897	.16533	.98624	29
32	.09642	.99534	.11378	.99351	.13110	.99137	.14838	.98893	.16562	.98619	28
33	.09671	.99531	.11407	.99347	.13139	.99133	.14867	.98889	.16591	.98614	27
34	.09700	.99528	.11436	.99344	.13168	.99129	.14896	.98884	.16620	.98609	26
35	.09729	.99526	.11465	.99341	.13197	.99125	.14925	.98880	.16648	.98604	25
36	.09758	.99523	.11494	.99337	.13226	.99122	.14954	.98876	.16677	.98600	24
37	.09787	.99520	.11523	.99334	.13254	.99118	.14982	.98871	.16706	.98595	23
38	.09816	.99517	.11552	.99331	.13283	.99114	.15011	.98867	.16734	.98590	22
39	.09845	.99514	.11580	.99327	.13312	.99110	.15040	.98863	.16763	.98585	21
40	.09874	.99511	.11609	.99324	.13341	.99106	.15069	.98858	.16792	.98580	20
41	.09903	.99508	.11638	.99320	.13370	.99102	.15097	.98854	.16820	.98575	19
42	.09932	.99506	.11667	.99317	.13399	.99098	.15126	.98849	.16849	.98570	18
43	.09961	.99503	.11696	.99314	.13427	.99094	.15155	.98845	.16878	.98565	17
44	.09990	.99500	.11725	.99310	.13456	.99091	.15184	.98841	.16906	.98561	16
45	.10019	.99497	.11754	.99307	.13485	.99087	.15212	.98836	.16935	.98556	15
46	.10048	.99494	.11783	.99303	.13514	.99083	.15241	.98832	.16964	.98551	14
47	.10077	.99491	.11812	.99300	.13543	.99079	.15270	.98827	.16992	.98546	13
48	.10106	.99488	.11840	.99297	.13572	.99075	.15299	.98823	.17021	.98541	12
49	.10135	.99485	.11869	.99293	.13600	.99071	.15327	.98818	.17050	.98536	11
50	.10164	.99482	.11898	.99290	.13629	.99067	.15356	.98814	.17078	.98531	10
51	.10192	.99479	.11927	.99286	.13658	.99063	.15385	.98809	.17107	.98526	9
52	.10221	.99476	.11956	.99283	.13687	.99059	.15414	.98805	.17136	.98521	8
53	.10250	.99473	.11985	.99279	.13716	.99055	.15442	.98800	.17164	.98516	7
54	.10279	.99470	.12014	.99276	.13744	.99051	.15471	.98796	.17193	.98511	6
55	.10308	.99467	.12043	.99272	.13773	.99047	.15500	.98791	.17222	.98506	5
56	.10337	.99464	.12071	.99269	.13802	.99043	.15529	.98787	.17250	.98501	4
57	.10366	.99461	.12100	.99265	.13831	.99039	.15557	.98782	.17279	.98496	3
58	.10395	.99458	.12129	.99262	.13860	.99035	.15586	.98778	.17308	.98491	2
59	.10424	.99455	.12158	.99258	.13889	.99031	.15615	.98773	.17336	.98486	1
60	.10453	.99452	.12187	.99255	.13917	.99027	.15643	.98769	.17365	.98481	0
′	84° Cosine	84° Sine	83° Cosine	83° Sine	82° Cosine	82° Sine	81° Cosine	81° Sine	80° Cosine	80° Sine	′

NATURAL SINES AND COSINES

′	10°		11°		12°		13°		14°		′
	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	
0	.17365	.98481	.19081	.98163	.20791	.97815	.22495	.97437	.24192	.97030	60
1	.17393	.98476	.19109	.98157	.20820	.97809	.22523	.97430	.24220	.97023	59
2	.17422	.98471	.19138	.98152	.20848	.97803	.22552	.97424	.24249	.97015	58
3	.17451	.98466	.19167	.98146	.20877	.97797	.22580	.97417	.24277	.97008	57
4	.17479	.98461	.19195	.98140	.20905	.97791	.22608	.97411	.24305	.97001	56
5	.17508	.98455	.19224	.98135	.20933	.97784	.22637	.97404	.24333	.96994	55
6	.17537	.98450	.19252	.98129	.20962	.97778	.22665	.97398	.24362	.96987	54
7	.17565	.98445	.19281	.98124	.20990	.97772	.22693	.97391	.24390	.96980	53
8	.17594	.98440	.19309	.98118	.21019	.97766	.22722	.97384	.24418	.96973	52
9	.17623	.98435	.19338	.98112	.21047	.97760	.22750	.97378	.24446	.96966	51
10	.17651	.98430	.19366	.98107	.21076	.97754	.22778	.97371	.24474	.96959	50
11	.17680	.98425	.19395	.98101	.21104	.97748	.22807	.97365	.24503	.96952	49
12	.17708	.98420	.19423	.98096	.21132	.97742	.22835	.97358	.24531	.96945	48
13	.17737	.98414	.19452	.98090	.21161	.97735	.22863	.97351	.24559	.96937	47
14	.17766	.98409	.19481	.98084	.21189	.97729	.22892	.97345	.24587	.96930	46
15	.17794	.98404	.19509	.98079	.21218	.97723	.22920	.97338	.24615	.96923	45
16	.17823	.98399	.19538	.98073	.21246	.97717	.22948	.97331	.24644	.96916	44
17	.17852	.98394	.19566	.98067	.21275	.97711	.22977	.97325	.24672	.96909	43
18	.17880	.98389	.19595	.98061	.21303	.97705	.23005	.97318	.24700	.96902	42
19	.17909	.98383	.19623	.98056	.21331	.97698	.23033	.97311	.24728	.96894	41
20	.17937	.98378	.19652	.98050	.21360	.97692	.23062	.97304	.24756	.96887	40
21	.17966	.98373	.19680	.98044	.21388	.97686	.23090	.97298	.24784	.96880	39
22	.17995	.98368	.19709	.98039	.21417	.97680	.23118	.97291	.24813	.96873	38
23	.18023	.98362	.19737	.98033	.21445	.97673	.23146	.97284	.24841	.96866	37
24	.18052	.98357	.19766	.98027	.21474	.97667	.23175	.97278	.24869	.96858	36
25	.18081	.98352	.19794	.98021	.21502	.97661	.23203	.97271	.24897	.96851	35
26	.18109	.98347	.19823	.98016	.21530	.97655	.23231	.97264	.24925	.96844	34
27	.18138	.98341	.19851	.98010	.21559	.97648	.23260	.97257	.24954	.96837	33
28	.18166	.98336	.19880	.98004	.21587	.97642	.23288	.97251	.24982	.96829	32
29	.18195	.98331	.19908	.97998	.21616	.97636	.23316	.97244	.25010	.96822	31
30	.18224	.98325	.19937	.97992	.21644	.97630	.23345	.97237	.25038	.96815	30
31	.18252	.98320	.19965	.97987	.21672	.97623	.23373	.97230	.25066	.96807	29
32	.18281	.98315	.19994	.97981	.21701	.97617	.23401	.97223	.25094	.96800	28
33	.18309	.98310	.20022	.97975	.21729	.97611	.23429	.97217	.25122	.96793	27
34	.18338	.98304	.20051	.97969	.21758	.97604	.23458	.97210	.25151	.96786	26
35	.18367	.98299	.20079	.97963	.21786	.97598	.23486	.97203	.25179	.96778	25
36	.18395	.98294	.20108	.97958	.21814	.97592	.23514	.97196	.25207	.96771	24
37	.18424	.98288	.20136	.97952	.21843	.97585	.23542	.97189	.25235	.96764	23
38	.18452	.98283	.20165	.97946	.21871	.97579	.23571	.97182	.25263	.96756	22
39	.18481	.98277	.20193	.97940	.21899	.97573	.23599	.97176	.25291	.96749	21
40	.18509	.98272	.20222	.97934	.21928	.97566	.23627	.97169	.25320	.96742	20
41	.18538	.98267	.20250	.97928	.21956	.97560	.23656	.97162	.25348	.96734	19
42	.18567	.98261	.20279	.97922	.21985	.97553	.23684	.97155	.25376	.96727	18
43	.18595	.98256	.20307	.97916	.22013	.97547	.23712	.97148	.25404	.96719	17
44	.18624	.98250	.20336	.97910	.22041	.97541	.23740	.97141	.25432	.96712	16
45	.18652	.98245	.20364	.97905	.22070	.97534	.23769	.97134	.25460	.96705	15
46	.18681	.98240	.20393	.97899	.22098	.97528	.23797	.97127	.25488	.96697	14
47	.18710	.98234	.20421	.97893	.22126	.97521	.23825	.97120	.25516	.96690	13
48	.18738	.98229	.20450	.97887	.22155	.97515	.23853	.97113	.25545	.96682	12
49	.18767	.98223	.20478	.97881	.22183	.97508	.23882	.97106	.25573	.96675	11
50	.18795	.98218	.20507	.97875	.22212	.97502	.23910	.97100	.25601	.96667	10
51	.18824	.98212	.20535	.97869	.22240	.97496	.23938	.97093	.25629	.96660	9
52	.18852	.98207	.20563	.97863	.22268	.97489	.23966	.97086	.25657	.96653	8
53	.18881	.98201	.20592	.97857	.22297	.97483	.23995	.97079	.25685	.96645	7
54	.18910	.98196	.20620	.97851	.22325	.97476	.24023	.97072	.25713	.96638	6
55	.18938	.98190	.20649	.97845	.22353	.97470	.24051	.97065	.25741	.96630	5
56	.18967	.98185	.20677	.97839	.22382	.97463	.24079	.97058	.25769	.96623	4
57	.18995	.98179	.20706	.97833	.22410	.97457	.24108	.97051	.25798	.96615	3
58	.19024	.98174	.20734	.97827	.22438	.97450	.24136	.97044	.25826	.96608	2
59	.19052	.98168	.20763	.97821	.22467	.97444	.24164	.97037	.25854	.96600	1
60	.19081	.98163	.20791	.97815	.22495	.97437	.24192	.97030	.25882	.96593	0
′	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	′
	79°		78°		77°		76°		75°		

NATURAL SINES AND COSINES

′	15° Sine	15° Cosine	16° Sine	16° Cosine	17° Sine	17° Cosine	18° Sine	18° Cosine	19° Sine	19° Cosine	′
0	.25882	.96593	.27564	.96126	.29237	.95630	.30902	.95106	.32557	.94552	60
1	.25910	.96585	.27592	.96118	.29265	.95622	.30929	.95097	.32584	.94542	59
2	.25938	.96578	.27620	.96110	.29293	.95613	.30957	.95088	.32612	.94533	58
3	.25966	.96570	.27648	.96102	.29321	.95605	.30985	.95079	.32639	.94523	57
4	.25994	.96562	.27676	.96094	.29348	.95596	.31012	.95070	.32667	.94514	56
5	.26022	.96555	.27704	.96086	.29376	.95588	.31040	.95061	.32694	.94504	55
6	.26050	.96547	.27731	.96078	.29404	.95579	.31068	.95052	.32722	.94495	54
7	.26079	.96540	.27759	.96070	.29432	.95571	.31095	.95043	.32749	.94485	53
8	.26107	.96532	.27787	.96062	.29460	.95562	.31123	.95033	.32777	.94476	52
9	.26135	.96524	.27815	.96054	.29487	.95554	.31151	.95024	.32804	.94466	51
10	.26163	.96517	.27843	.96046	.29515	.95545	.31178	.95015	.32832	.94457	50
11	.26191	.96509	.27871	.96037	.29543	.95536	.31206	.95006	.32859	.94447	49
12	.26219	.96502	.27899	.96029	.29571	.95528	.31233	.94997	.32887	.94438	48
13	.26247	.96494	.27927	.96021	.29599	.95519	.31261	.94988	.32914	.94428	47
14	.26275	.96486	.27955	.96013	.29626	.95511	.31289	.94979	.32942	.94418	46
15	.26303	.96479	.27983	.96005	.29654	.95502	.31316	.94970	.32969	.94409	45
16	.26331	.96471	.28011	.95997	.29682	.95493	.31344	.94961	.32997	.94399	44
17	.26359	.96463	.28039	.95989	.29710	.95485	.31372	.94952	.33024	.94390	43
18	.26387	.96456	.28067	.95981	.29737	.95476	.31399	.94943	.33051	.94380	42
19	.26415	.96448	.28095	.95972	.29765	.95467	.31427	.94933	.33079	.94370	41
20	.26443	.96440	.28123	.95964	.29793	.95459	.31454	.94924	.33106	.94361	40
21	.26471	.96433	.28150	.95956	.29821	.95450	.31482	.94915	.33134	.94351	39
22	.26500	.96425	.28178	.95948	.29849	.95441	.31510	.94906	.33161	.94342	38
23	.26528	.96417	.28206	.95940	.29876	.95433	.31537	.94897	.33189	.94332	37
24	.26556	.96410	.28234	.95931	.29904	.95424	.31565	.94888	.33216	.94322	36
25	.26584	.96402	.28262	.95923	.29932	.95415	.31593	.94878	.33244	.94313	35
26	.26612	.96394	.28290	.95915	.29960	.95407	.31620	.94869	.33271	.94303	34
27	.26640	.96386	.28318	.95907	.29987	.95398	.31648	.94860	.33298	.94293	33
28	.26668	.96379	.28346	.95898	.30015	.95389	.31675	.94851	.33326	.94284	32
29	.26696	.96371	.28374	.95890	.30043	.95380	.31703	.94842	.33353	.94274	31
30	.26724	.96363	.28402	.95882	.30071	.95372	.31730	.94832	.33381	.94264	30
31	.26752	.96355	.28429	.95874	.30098	.95363	.31758	.94823	.33408	.94254	29
32	.26780	.96347	.28457	.95865	.30126	.95354	.31786	.94814	.33436	.94245	28
33	.26808	.96340	.28485	.95857	.30154	.95345	.31813	.94805	.33463	.94235	27
34	.26836	.96332	.28513	.95849	.30182	.95337	.31841	.94795	.33490	.94225	26
35	.26864	.96324	.28541	.95841	.30209	.95328	.31868	.94786	.33518	.94215	25
36	.26892	.96316	.28569	.95832	.30237	.95319	.31896	.94777	.33545	.94206	24
37	.26920	.96308	.28597	.95824	.30265	.95310	.31923	.94768	.33573	.94196	23
38	.26948	.96301	.28625	.95816	.30292	.95301	.31951	.94758	.33600	.94186	22
39	.26976	.96293	.28652	.95807	.30320	.95293	.31979	.94749	.33627	.94176	21
40	.27004	.96285	.28680	.95799	.30348	.95284	.32006	.94740	.33655	.94167	20
41	.27032	.96277	.28708	.95791	.30376	.95275	.32034	.94730	.33682	.94157	19
42	.27060	.96269	.28736	.95782	.30403	.95266	.32061	.94721	.33710	.94147	18
43	.27088	.96261	.28764	.95774	.30431	.95257	.32089	.94712	.33737	.94137	17
44	.27116	.96253	.28792	.95766	.30459	.95248	.32116	.94702	.33764	.94127	16
45	.27144	.96246	.28820	.95757	.30486	.95240	.32144	.94693	.33792	.94118	15
46	.27172	.96238	.28847	.95749	.30514	.95231	.32171	.94684	.33819	.94108	14
47	.27200	.96230	.28875	.95740	.30542	.95222	.32199	.94674	.33846	.94098	13
48	.27228	.96222	.28903	.95732	.30570	.95213	.32227	.94665	.33874	.94088	12
49	.27256	.96214	.28931	.95724	.30597	.95204	.32254	.94656	.33901	.94078	11
50	.27284	.96206	.28959	.95715	.30625	.95195	.32282	.94646	.33929	.94068	10
51	.27312	.96198	.28987	.95707	.30653	.95186	.32309	.94637	.33956	.94058	9
52	.27340	.96190	.29015	.95698	.30680	.95177	.32337	.94627	.33983	.94049	8
53	.27368	.96182	.29042	.95690	.30708	.95168	.32364	.94618	.34011	.94039	7
54	.27396	.96174	.29070	.95681	.30736	.95159	.32392	.94609	.34038	.94029	6
55	.27424	.96166	.29098	.95673	.30763	.95150	.32419	.94599	.34065	.94019	5
56	.27452	.96158	.29126	.95664	.30791	.95142	.32447	.94590	.34093	.94009	4
57	.27480	.96150	.29154	.95656	.30819	.95133	.32474	.94580	.34120	.93999	3
58	.27508	.96142	.29182	.95647	.30846	.95124	.32502	.94571	.34147	.93989	2
59	.27536	.96134	.29209	.95639	.30874	.95115	.32529	.94561	.34175	.93979	1
60	.27564	.96126	.29237	.95630	.30902	.95106	.32557	.94552	.34202	.93969	0
′	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	′
	74°		73°		72°		71°		70°		

NATURAL SINES AND COSINES

′	20° Sine	20° Cosine	21° Sine	21° Cosine	22° Sine	22° Cosine	23° Sine	23° Cosine	24° Sine	24° Cosine	′
0	.34202	.93969	.35837	.93358	.37461	.92718	.39073	.92050	.40674	.91355	60
1	.34229	.93959	.35864	.93348	.37488	.92707	.39100	.92039	.40700	.91343	59
2	.34257	.93949	.35891	.93337	.37515	.92697	.39127	.92028	.40727	.91331	58
3	.34284	.93939	.35918	.93327	.37542	.92686	.39153	.92016	.40753	.91319	57
4	.34311	.93929	.35945	.93316	.37569	.92675	.39180	.92005	.40780	.91307	56
5	.34339	.93919	.35973	.93306	.37595	.92664	.39207	.91994	.40806	.91295	55
6	.34366	.93909	.36000	.93295	.37622	.92653	.39234	.91982	.40833	.91283	54
7	.34393	.93899	.36027	.93285	.37649	.92642	.39260	.91971	.40860	.91272	53
8	.34421	.93889	.36054	.93274	.37676	.92631	.39287	.91959	.40886	.91260	52
9	.34448	.93879	.36081	.93264	.37703	.92620	.39314	.91948	.40913	.91248	51
10	.34475	.93869	.36108	.93253	.37730	.92609	.39341	.91936	.40939	.91236	50
11	.34503	.93859	.36135	.93243	.37757	.92598	.39367	.91925	.40966	.91224	49
12	.34530	.93849	.36162	.93232	.37784	.92587	.39394	.91914	.40992	.91212	48
13	.34557	.93839	.36190	.93222	.37811	.92576	.39421	.91902	.41019	.91200	47
14	.34584	.93829	.36217	.93211	.37838	.92565	.39448	.91891	.41045	.91188	46
15	.34612	.93819	.36244	.93201	.37865	.92554	.39474	.91879	.41072	.91176	45
16	.34639	.93809	.36271	.93190	.37892	.92543	.39501	.91868	.41098	.91164	44
17	.34666	.93799	.36298	.93180	.37919	.92532	.39528	.91856	.41125	.91152	43
18	.34694	.93789	.36325	.93169	.37946	.92521	.39555	.91845	.41151	.91140	42
19	.34721	.93779	.36352	.93159	.37973	.92510	.39581	.91833	.41178	.91128	41
20	.34748	.93769	.36379	.93148	.37999	.92499	.39608	.91822	.41204	.91116	40
21	.34775	.93759	.36406	.93137	.38026	.92488	.39635	.91810	.41231	.91104	39
22	.34803	.93748	.36434	.93127	.38053	.92477	.39661	.91799	.41257	.91092	38
23	.34830	.93738	.36461	.93116	.38080	.92466	.39688	.91787	.41284	.91080	37
24	.34857	.93728	.36488	.93106	.38107	.92455	.39715	.91775	.41310	.91068	36
25	.34884	.93718	.36515	.93095	.38134	.92444	.39741	.91764	.41337	.91056	35
26	.34912	.93708	.36542	.93084	.38161	.92432	.39768	.91752	.41363	.91044	34
27	.34939	.93698	.36569	.93074	.38188	.92421	.39795	.91741	.41390	.91032	33
28	.34966	.93688	.36596	.93063	.38215	.92410	.39822	.91729	.41416	.91020	32
29	.34993	.93677	.36623	.93052	.38241	.92399	.39848	.91718	.41443	.91008	31
30	.35021	.93667	.36650	.93042	.38268	.92388	.39875	.91706	.41469	.90996	30
31	.35048	.93657	.36677	.93031	.38295	.92377	.39902	.91694	.41496	.90984	29
32	.35075	.93647	.36704	.93020	.38322	.92366	.39928	.91683	.41522	.90972	28
33	.35102	.93637	.36731	.93010	.38349	.92355	.39955	.91671	.41549	.90960	27
34	.35130	.93626	.36758	.92999	.38376	.92343	.39982	.91660	.41575	.90948	26
35	.35157	.93616	.36785	.92988	.38403	.92332	.40008	.91648	.41602	.90936	25
36	.35184	.93606	.36812	.92978	.38430	.92321	.40035	.91636	.41628	.90924	24
37	.35211	.93596	.36839	.92967	.38456	.92310	.40062	.91625	.41655	.90911	23
38	.35239	.93585	.36867	.92956	.38483	.92299	.40088	.91613	.41681	.90899	22
39	.35266	.93575	.36894	.92945	.38510	.92287	.40115	.91601	.41707	.90887	21
40	.35293	.93565	.36921	.92935	.38537	.92276	.40141	.91590	.41734	.90875	20
41	.35320	.93555	.36948	.92924	.38564	.92265	.40168	.91578	.41760	.90863	19
42	.35347	.93544	.36975	.92913	.38591	.92254	.40195	.91566	.41787	.90851	18
43	.35375	.93534	.37002	.92902	.38617	.92243	.40221	.91555	.41813	.90839	17
44	.35402	.93524	.37029	.92892	.38644	.92231	.40248	.91543	.41840	.90826	16
45	.35429	.93514	.37056	.92881	.38671	.92220	.40275	.91531	.41866	.90814	15
46	.35456	.93503	.37083	.92870	.38698	.92209	.40301	.91519	.41892	.90802	14
47	.35484	.93493	.37110	.92859	.38725	.92198	.40328	.91508	.41919	.90790	13
48	.35511	.93483	.37137	.92849	.38752	.92186	.40355	.91496	.41945	.90778	12
49	.35538	.93472	.37164	.92838	.38778	.92175	.40381	.91484	.41972	.90766	11
50	.35565	.93462	.37191	.92827	.38805	.92164	.40408	.91472	.41998	.90753	10
51	.35592	.93452	.37218	.92816	.38832	.92152	.40434	.91461	.42024	.90741	9
52	.35619	.93441	.37245	.92805	.38859	.92141	.40461	.91449	.42051	.90729	8
53	.35647	.93431	.37272	.92794	.38886	.92130	.40488	.91437	.42077	.90717	7
54	.35674	.93420	.37299	.92784	.38912	.92119	.40514	.91425	.42104	.90704	6
55	.35701	.93410	.37326	.92773	.38939	.92107	.40541	.91414	.42130	.90692	5
56	.35728	.93400	.37353	.92762	.38966	.92096	.40567	.91402	.42156	.90680	4
57	.35755	.93389	.37380	.92751	.38993	.92085	.40594	.91390	.42183	.90668	3
58	.35782	.93379	.37407	.92740	.39020	.92073	.40621	.91378	.42209	.90655	2
59	.35810	.93368	.37434	.92729	.39046	.92062	.40647	.91366	.42235	.90643	1
60	.35837	.93358	.37461	.92718	.39073	.92050	.40674	.91355	.42262	.90631	0
′	Cosine 69°	Sine 69°	Cosine 68°	Sine 68°	Cosine 67°	Sine 67°	Cosine 66°	Sine 66°	Cosine 65°	Sine 65°	′

NATURAL SINES AND COSINES

′	25°		26°		27°		28°		29°		′
	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	
0	.42262	.90631	.43837	.89879	.45399	.89101	.46947	.88295	.48481	.87462	60
1	.42288	.90618	.43863	.89867	.45425	.89087	.46973	.88281	.48506	.87448	59
2	.42315	.90606	.43889	.89854	.45451	.89074	.46999	.88267	.48532	.87434	58
3	.42341	.90594	.43916	.89841	.45477	.89061	.47024	.88254	.48557	.87420	57
4	.42367	.90582	.43942	.89828	.45503	.89048	.47050	.88240	.48583	.87406	56
5	.42394	.90569	.43968	.89816	.45529	.89035	.47076	.88226	.48608	.87391	55
6	.42420	.90557	.43994	.89803	.45554	.89021	.47101	.88213	.48634	.87377	54
7	.42446	.90545	.44020	.89790	.45580	.89008	.47127	.88199	.48659	.87363	53
8	.42473	.90532	.44046	.89777	.45606	.88995	.47153	.88185	.48684	.87349	52
9	.42499	.90520	.44072	.89764	.45632	.88981	.47178	.88172	.48710	.87335	51
10	.42525	.90507	.44098	.89752	.45658	.88968	.47204	.88158	.48735	.87321	50
11	.42552	.90495	.44124	.89739	.45684	.88955	.47229	.88144	.48761	.87306	49
12	.42578	.90483	.44151	.89726	.45710	.88942	.47255	.88130	.48786	.87292	48
13	.42604	.90470	.44177	.89713	.45736	.88928	.47281	.88117	.48811	.87278	47
14	.42631	.90458	.44203	.89700	.45762	.88915	.47306	.88103	.48837	.87264	46
15	.42657	.90446	.44229	.89687	.45787	.88902	.47332	.88089	.48862	.87250	45
16	.42683	.90433	.44255	.89674	.45813	.88888	.47358	.88075	.48888	.87235	44
17	.42709	.90421	.44281	.89662	.45839	.88875	.47383	.88062	.48913	.87221	43
18	.42736	.90408	.44307	.89649	.45865	.88862	.47409	.88048	.48938	.87207	42
19	.42762	.90396	.44333	.89636	.45891	.88848	.47434	.88034	.48964	.87193	41
20	.42788	.90383	.44359	.89623	.45917	.88835	.47460	.88020	.48989	.87178	40
21	.42815	.90371	.44385	.89610	.45942	.88822	.47486	.88006	.49014	.87164	39
22	.42841	.90358	.44411	.89597	.45968	.88808	.47511	.87993	.49040	.87150	38
23	.42867	.90346	.44437	.89584	.45994	.88795	.47537	.87979	.49065	.87136	37
24	.42894	.90334	.44464	.89571	.46020	.88782	.47562	.87965	.49090	.87121	36
25	.42920	.90321	.44490	.89558	.46046	.88768	.47588	.87951	.49116	.87107	35
26	.42946	.90309	.44516	.89545	.46072	.88755	.47614	.87937	.49141	.87093	34
27	.42972	.90296	.44542	.89532	.46097	.88741	.47639	.87923	.49166	.87079	33
28	.42999	.90284	.44568	.89519	.46123	.88728	.47665	.87909	.49192	.87064	32
29	.43025	.90271	.44594	.89506	.46149	.88715	.47690	.87896	.49217	.87050	31
30	.43051	.90259	.44620	.89493	.46175	.88701	.47716	.87882	.49242	.87036	30
31	.43077	.90246	.44646	.89480	.46201	.88688	.47741	.87868	.49268	.87021	29
32	.43104	.90233	.44672	.89467	.46226	.88674	.47767	.87854	.49293	.87007	28
33	.43130	.90221	.44698	.89454	.46252	.88661	.47793	.87840	.49318	.86993	27
34	.43156	.90208	.44724	.89441	.46278	.88647	.47818	.87826	.49344	.86978	26
35	.43182	.90196	.44750	.89428	.46304	.88634	.47844	.87812	.49369	.86964	25
36	.43209	.90183	.44776	.89415	.46330	.88620	.47869	.87798	.49394	.86949	24
37	.43235	.90171	.44802	.89402	.46355	.88607	.47895	.87784	.49419	.86935	23
38	.43261	.90158	.44828	.89389	.46381	.88593	.47920	.87770	.49445	.86921	22
39	.43287	.90146	.44854	.89376	.46407	.88580	.47946	.87756	.49470	.86906	21
40	.43313	.90133	.44880	.89363	.46433	.88566	.47971	.87743	.49495	.86892	20
41	.43340	.90120	.44906	.89350	.46458	.88553	.47997	.87729	.49521	.86878	19
42	.43366	.90108	.44932	.89337	.46484	.88539	.48022	.87715	.49546	.86863	18
43	.43392	.90095	.44958	.89324	.46510	.88526	.48048	.87701	.49571	.86849	17
44	.43418	.90082	.44984	.89311	.46536	.88512	.48073	.87687	.49596	.86834	16
45	.43445	.90070	.45010	.89298	.46561	.88499	.48099	.87673	.49622	.86820	15
46	.43471	.90057	.45036	.89285	.46587	.88485	.48124	.87659	.49647	.86805	14
47	.43497	.90045	.45062	.89272	.46613	.88472	.48150	.87645	.49672	.86791	13
48	.43523	.90032	.45088	.89259	.46639	.88458	.48175	.87631	.49697	.86777	12
49	.43549	.90019	.45114	.89245	.46664	.88445	.48201	.87617	.49723	.86762	11
50	.43575	.90007	.45140	.89232	.46690	.88431	.48226	.87603	.49748	.86748	10
51	.43602	.89994	.45166	.89219	.46716	.88417	.48252	.87589	.49773	.86733	9
52	.43628	.89981	.45192	.89206	.46742	.88404	.48277	.87575	.49798	.86719	8
53	.43654	.89968	.45218	.89193	.46767	.88390	.48303	.87561	.49824	.86704	7
54	.43680	.89956	.45243	.89180	.46793	.88377	.48328	.87546	.49849	.86690	6
55	.43706	.89943	.45269	.89167	.46819	.88363	.48354	.87532	.49874	.86675	5
56	.43733	.89930	.45295	.89153	.46844	.88349	.48379	.87518	.49899	.86661	4
57	.43759	.89918	.45321	.89140	.46870	.88336	.48405	.87504	.49924	.86646	3
58	.43785	.89905	.45347	.89127	.46896	.88322	.48430	.87490	.49950	.86632	2
59	.43811	.89892	.45373	.89114	.46921	.88308	.48456	.87476	.49975	.86617	1
60	.43837	.89879	.45399	.89101	.46947	.88295	.48481	.87462	.50000	.86603	0
	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	
′	64°		63°		62°		61°		60°		′

NATURAL SINES AND COSINES

′	30°		31°		32°		33°		34°		′
	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	
0	.50000	.86603	.51504	.85717	.52992	.84805	.54464	.83867	.55919	.82904	60
1	.50025	.86588	.51529	.85702	.53017	.84789	.54488	.83851	.55943	.82887	59
2	.50050	.86573	.51554	.85687	.53041	.84774	.54513	.83835	.55968	.82871	58
3	.50076	.86559	.51579	.85672	.53066	.84759	.54537	.83819	.55992	.82855	57
4	.50101	.86544	.51604	.85657	.53091	.84743	.54561	.83804	.56016	.82839	56
5	.50126	.86530	.51628	.85642	.53115	.84728	.54586	.83788	.56040	.82822	55
6	.50151	.86515	.51653	.85627	.53140	.84712	.54610	.83772	.56064	.82806	54
7	.50176	.86501	.51678	.85612	.53164	.84697	.54635	.83756	.56088	.82790	53
8	.50201	.86486	.51703	.85597	.53189	.84681	.54659	.83740	.56112	.82773	52
9	.50227	.86471	.51728	.85582	.53214	.84666	.54683	.83724	.56136	.82757	51
10	.50252	.86457	.51753	.85567	.53238	.84650	.54708	.83708	.56160	.82741	50
11	.50277	.86442	.51778	.85551	.53263	.84635	.54732	.83692	.56184	.82724	49
12	.50302	.86427	.51803	.85536	.53288	.84619	.54756	.83676	.56208	.82708	48
13	.50327	.86413	.51828	.85521	.53312	.84604	.54781	.83660	.56232	.82692	47
14	.50352	.86398	.51852	.85506	.53337	.84588	.54805	.83645	.56256	.82675	46
15	.50377	.86384	.51877	.85491	.53361	.84573	.54829	.83629	.56280	.82659	45
16	.50403	.86369	.51902	.85476	.53386	.84557	.54854	.83613	.56305	.82643	44
17	.50428	.86354	.51927	.85461	.53411	.84542	.54878	.83597	.56329	.82626	43
18	.50453	.86340	.51952	.85446	.53435	.84526	.54902	.83581	.56353	.82610	42
19	.50478	.86325	.51977	.85431	.53460	.84511	.54927	.83565	.56377	.82593	41
20	.50503	.86310	.52002	.85416	.53484	.84495	.54951	.83549	.56401	.82577	40
21	.50528	.86295	.52026	.85401	.53509	.84480	.54975	.83533	.56425	.82561	39
22	.50553	.86281	.52051	.85385	.53534	.84464	.54999	.83517	.56449	.82544	38
23	.50578	.86266	.52076	.85370	.53558	.84448	.55024	.83501	.56473	.82528	37
24	.50603	.86251	.52101	.85355	.53583	.84433	.55048	.83485	.56497	.82511	36
25	.50628	.86237	.52126	.85340	.53607	.84417	.55072	.83469	.56521	.82495	35
26	.50654	.86222	.52151	.85325	.53632	.84402	.55097	.83453	.56545	.82478	34
27	.50679	.86207	.52175	.85310	.53656	.84386	.55121	.83437	.56569	.82462	33
28	.50704	.86192	.52200	.85294	.53681	.84370	.55145	.83421	.56593	.82446	32
29	.50729	.86178	.52225	.85279	.53705	.84355	.55169	.83405	.56617	.82429	31
30	.50754	.86163	.52250	.85264	.53730	.84339	.55194	.83389	.56641	.82413	30
31	.50779	.86148	.52275	.85249	.53754	.84324	.55218	.83373	.56665	.82396	29
32	.50804	.86133	.52299	.85234	.53779	.84308	.55242	.83356	.56689	.82380	28
33	.50829	.86119	.52324	.85218	.53804	.84292	.55266	.83340	.56713	.82363	27
34	.50854	.86104	.52349	.85203	.53828	.84277	.55291	.83324	.56736	.82347	26
35	.50879	.86089	.52374	.85188	.53853	.84261	.55315	.83308	.56760	.82330	25
36	.50904	.86074	.52399	.85173	.53877	.84245	.55339	.83292	.56784	.82314	24
37	.50929	.86059	.52423	.85157	.53902	.84230	.55363	.83276	.56808	.82297	23
38	.50954	.86045	.52448	.85142	.53926	.84214	.55388	.83260	.56832	.82281	22
39	.50979	.86030	.52473	.85127	.53951	.84198	.55412	.83244	.56856	.82264	21
40	.51004	.86015	.52498	.85112	.53975	.84182	.55436	.83228	.56880	.82248	20
41	.51029	.86000	.52522	.85096	.54000	.84167	.55460	.83212	.56904	.82231	19
42	.51054	.85985	.52547	.85081	.54024	.84151	.55484	.83195	.56928	.82214	18
43	.51079	.85970	.52572	.85066	.54049	.84135	.55509	.83179	.56952	.82198	17
44	.51104	.85956	.52597	.85051	.54073	.84120	.55533	.83163	.56976	.82181	16
45	.51129	.85941	.52621	.85035	.54097	.84104	.55557	.83147	.57000	.82165	15
46	.51154	.85926	.52646	.85020	.54122	.84088	.55581	.83131	.57024	.82148	14
47	.51179	.85911	.52671	.85005	.54146	.84072	.55605	.83115	.57047	.82132	13
48	.51204	.85896	.52696	.84989	.54171	.84057	.55630	.83098	.57071	.82115	12
49	.51229	.85881	.52720	.84974	.54195	.84041	.55654	.83082	.57095	.82098	11
50	.51254	.85866	.52745	.84959	.54220	.84025	.55678	.83066	.57119	.82082	10
51	.51279	.85851	.52770	.84943	.54244	.84009	.55702	.83050	.57143	.82065	9
52	.51304	.85836	.52794	.84928	.54269	.83994	.55726	.83034	.57167	.82048	8
53	.51329	.85821	.52819	.84913	.54293	.83978	.55750	.83017	.57191	.82032	7
54	.51354	.85806	.52844	.84897	.54317	.83962	.55775	.83001	.57215	.82015	6
55	.51379	.85792	.52869	.84882	.54342	.83946	.55799	.82985	.57238	.81999	5
56	.51404	.85777	.52893	.84866	.54366	.83930	.55823	.82969	.57262	.81982	4
57	.51429	.85762	.52918	.84851	.54391	.83915	.55847	.82953	.57286	.81965	3
58	.51454	.85747	.52943	.84836	.54415	.83899	.55871	.82936	.57310	.81949	2
59	.51479	.85732	.52967	.84820	.54440	.83883	.55895	.82920	.57334	.81932	1
60	.51504	.85717	.52992	.84805	.54464	.83867	.55919	.82904	.57358	.81915	0
	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	
′	59°		58°		57°		56°		55°		′

NATURAL SINES AND COSINES

′	35°		36°		37°		38°		39°		′
	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	
0	.57358	.81915	.58779	.80902	.60182	.79864	.61566	.78801	.62932	.77715	60
1	.57381	.81899	.5 802	.80885	.60205	.79846	.61589	.78783	.62955	.77696	59
2	.57405	.81882	.5 826	.80867	.60228	.79829	.61612	.78765	.62977	.77678	58
3	.57429	.81865	.58849	.80850	.60251	.79811	.61635	.78747	.63000	.77660	57
4	.57453	.81848	.58873	.80833	.60274	.79793	.61658	.78729	.63022	.77641	56
5	.57477	.81832	.58896	.80816	.60298	.79776	.61681	.78711	.63045	.77623	55
6	.57501	.81815	.58920	.80799	.60321	.79758	.61704	.78694	.63068	.77605	54
7	.57524	.81798	.58943	.80782	.60344	.79741	.61726	.78676	.63090	.77586	53
8	.57548	.81782	.58967	.80765	.60367	.79723	.61749	.78658	.63113	.77568	52
9	.57572	.81765	.58990	.80748	.60390	.79706	.61772	.78640	.63135	.77550	51
10	.57596	.81748	.59014	.80730	.60414	.79688	.61795	.78622	.63158	.77531	50
11	.57619	.81731	.59037	.80713	.60437	.79671	.61818	.78604	.63180	.77513	49
12	.57643	.81714	.59061	.80696	.60460	.79653	.61841	.78586	.63203	.77494	48
13	.57667	.81698	.59084	.80679	.60483	.79635	.61864	.78568	.63225	.77476	47
14	.57691	.81681	.59108	.80662	.60506	.79618	.61887	.78550	.63248	.77458	46
15	.57715	.81664	.59131	.80644	.60529	.79600	.61909	.78532	.63271	.77439	45
16	.57738	.81647	.59154	.80627	.60553	.79583	.61932	.78514	.63293	.77421	44
17	.57762	.81631	.59178	.80610	.60576	.79565	.61955	.78496	.63316	.77402	43
18	.57786	.81614	.59201	.80593	.60599	.79547	.61978	.78478	.63338	.77384	42
19	.57810	.81597	.59225	.80576	.60622	.79530	.62001	.78460	.63361	.77366	41
20	.57833	.81580	.59248	.80558	.60645	.79512	.62024	.78442	.63383	.77347	40
21	.57857	.81563	.59272	.80541	.60668	.79494	.62046	.78424	.63406	.77329	39
22	.57881	.81546	.59295	.80524	.60691	.79477	.62069	.78405	.63428	.77310	38
23	.57904	.81530	.59318	.80507	.60714	.79459	.62092	.78387	.63451	.77292	37
24	.57928	.81513	.59342	.80489	.60738	.79441	.62115	.78369	.63473	.77273	36
25	.57952	.81496	.59365	.80472	.60761	.79424	.62138	.78351	.63496	.77255	35
26	.57976	.81479	.59389	.80455	.60784	.79406	.62160	.78333	.63518	.77236	34
27	.57999	.81462	.59412	.80438	.60807	.79388	.62183	.78315	.63540	.77218	33
28	.58023	.81445	.59436	.80420	.60830	.79371	.62206	.78297	.63563	.77199	32
29	.58047	.81428	.59459	.80403	.60853	.79353	.62229	.78279	.63585	.77181	31
30	.58070	.81412	.59482	.80386	.60876	.79335	.62251	.78261	.63608	.77162	30
31	.58094	.81395	.59506	.80368	.60899	.79318	.62274	.78243	.63630	.77144	29
32	.58118	.81378	.59529	.80351	.60922	.79300	.62297	.78225	.63653	.77125	28
33	.58141	.81361	.59552	.80334	.60945	.79282	.62320	.78206	.63675	.77107	27
34	.58165	.81344	.59576	.80316	.60968	.79264	.62342	.78188	.63698	.77088	26
35	.58189	.81327	.59599	.80299	.60991	.79247	.62365	.78170	.63720	.77070	25
36	.58212	.81310	.59622	.80282	.61015	.79229	.62388	.78152	.63742	.77051	24
37	.58236	.81293	.59646	.80264	.61038	.79211	.62411	.78134	.63765	.77033	23
38	.58260	.81276	.59669	.80247	.61061	.79193	.62433	.78116	.63787	.77014	22
39	.58283	.81259	.59693	.80230	.61084	.79176	.62456	.78098	.63810	.76996	21
40	.58307	.81242	.59716	.80212	.61107	.79158	.62479	.78079	.63832	.76977	20
41	.58330	.81225	.59739	.80195	.61130	.79140	.62502	.78061	.63854	.76959	19
42	.58354	.81208	.59763	.80178	.61153	.79122	.62524	.78043	.63877	.76940	18
43	.58378	.81191	.59786	.80160	.61176	.79105	.62547	.78025	.63899	.76921	17
44	.58401	.81174	.59809	.80143	.61199	.79087	.62570	.78007	.63922	.76903	16
45	.58425	.81157	.59832	.80125	.61222	.79069	.62592	.77988	.63944	.76884	15
46	.58449	.81140	.59856	.80108	.61245	.79051	.62615	.77970	.63966	.76866	14
47	.58472	.81123	.59879	.80091	.61268	.79033	.62638	.77952	.63989	.76847	13
48	.58496	.81106	.59902	.80073	.61291	.79016	.62660	.77934	.64011	.76828	12
49	.58519	.81089	.59926	.80056	.61314	.78998	.62683	.77916	.64033	.76810	11
50	.58543	.81072	.59949	.80038	.61337	.78980	.62706	.77897	.64056	.76791	10
51	.58567	.81055	.59972	.80021	.61360	.78962	.62728	.77879	.64078	.76772	9
52	.58590	.81038	.59995	.80003	.61383	.78944	.62751	.77861	.64100	.76754	8
53	.58614	.81021	.60019	.79986	.61406	.78926	.62774	.77843	.64123	.76735	7
54	.58637	.81004	.60042	.79968	.61429	.78908	.62796	.77824	.64145	.76717	6
55	.58661	.80987	.60065	.79951	.61451	.78891	.62819	.77806	.64167	.76698	5
56	.58684	.80970	.60089	.79934	.61474	.78873	.62842	.77788	.64190	.76679	4
57	.58708	.80953	.60112	.79916	.61497	.78855	.62864	.77769	.64212	.76661	3
58	.58731	.80936	.60135	.79899	.61520	.78837	.62887	.77751	.64234	.76642	2
59	.58755	.80919	.60158	.79881	.61543	.78819	.62909	.77733	.64256	.76623	1
60	.58779	.80902	.60182	.79864	.61566	.78801	.62932	.77715	.64279	.76604	0
′	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	′
	54°		53°		52°		51°		50°		

NATURAL SINES AND COSINES

′	40°		41°		42°		43°		44°		′
	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	
0	.64279	.76604	.65606	.75471	.66913	.74314	.68200	.73135	.69466	.71934	60
1	.64301	.76586	.65628	.75452	.66935	.74295	.68221	.73116	.69487	.71914	59
2	.64323	.76567	.65650	.75433	.66956	.74276	.68242	.73096	.69508	.71894	58
3	.64346	.76548	.65672	.75414	.66978	.74256	.68264	.73076	.69529	.71873	57
4	.64368	.76530	.65694	.75395	.66999	.74237	.68285	.73056	.69549	.71853	56
5	.64390	.76511	.65716	.75375	.67021	.74217	.68306	.73036	.69570	.71833	55
6	.64412	.76492	.65738	.75356	.67043	.74198	.68327	.73016	.69591	.71813	54
7	.64435	.76473	.65759	.75337	.67064	.74178	.68349	.72996	.69612	.71792	53
8	.64457	.76455	.65781	.75318	.67086	.74159	.68370	.72976	.69633	.71772	52
9	.64479	.76436	.65803	.75299	.67107	.74139	.68391	.72957	.69654	.71752	51
10	.64501	.76417	.65825	.75280	.67129	.74120	.68412	.72937	.69675	.71732	50
11	.64524	.76398	.65847	.75261	.67151	.74100	.68434	.72917	.69696	.71711	49
12	.64546	.76380	.65869	.75241	.67172	.74080	.68455	.72897	.69717	.71691	48
13	.64568	.76361	.65891	.75222	.67194	.74061	.68476	.72877	.69737	.71671	47
14	.64590	.76342	.65913	.75203	.67215	.74041	.68497	.72857	.69758	.71650	46
15	.64612	.76323	.65935	.75184	.67237	.74022	.68518	.72837	.69779	.71630	45
16	.64635	.76304	.65956	.75165	.67258	.74002	.68539	.72817	.69800	.71610	44
17	.64657	.76286	.65978	.75146	.67280	.73983	.68561	.72797	.69821	.71590	43
18	.64679	.76267	.66000	.75126	.67301	.73963	.68582	.72777	.6[illegible]842	.71569	42
19	.64701	.76248	.66022	.75107	.67323	.73944	.68603	.72757	.69[illegible]62	.71549	41
20	.64723	.76229	.66044	.75088	.67344	.73924	.68624	.72737	.69883	.71529	40
21	.64746	.76210	.66066	.75069	.67366	.73904	.68645	.72717	.69904	.71508	39
22	.64768	.76192	.66088	.75050	.67387	.73885	.68666	.72697	.69925	.71488	38
23	.64790	.76173	.66109	.75030	.67409	.73865	.68688	.72677	.69946	.71468	37
24	.64812	.76154	.66131	.75011	.67430	.73846	.68709	.72657	.69966	.71447	36
25	.64834	.76135	.66153	.74992	.67452	.73826	.68730	.72637	.69987	.71427	35
26	.64856	.76116	.66175	.74973	.67473	.73806	.68751	.72617	.70008	.71407	34
27	.64878	.76097	.66197	.74953	.67495	.73787	.68772	.72597	.70029	.71386	33
28	.64901	.76078	.66218	.74934	.67516	.73767	.68793	.72577	.70049	.71366	32
29	.64923	.76059	.66240	.74915	.67538	.73747	.68814	.72557	.70070	.71345	31
30	.64945	.76041	.66262	.74896	.67559	.73728	.68835	.72537	.70091	.71325	30
31	.64967	.76022	.66284	.74876	.67580	.73708	.68857	.72517	.70112	.71305	29
32	.64989	.76003	.66306	.74857	.67602	.73688	.68878	.72497	.70132	.71284	28
33	.65011	.75984	.66327	.74838	.67623	.73669	.68899	.72477	.70153	.71264	27
34	.65033	.75965	.66349	.74818	.67645	.73649	.68920	.72457	.70174	.71243	26
35	.65055	.75946	.66371	.74799	.67666	.73629	.68941	.72437	.70195	.71223	25
36	.65077	.75927	.66393	.74780	.67688	.73610	.68962	.72417	.70215	.71203	24
37	.65100	.75908	.66414	.74760	.67709	.73590	.68983	.72397	.70236	.71182	23
38	.65122	.75889	.66436	.74741	.67730	.73570	.69004	.72377	.70257	.71162	22
39	.65144	.75870	.66458	.74722	.67752	.73551	.69025	.72357	.70277	.71141	21
40	.65166	.75851	.66480	.74703	.67773	.73531	.69046	.72337	.70298	.71121	20
41	.65188	.75832	.66501	.74683	.67795	.73511	.69067	.72317	.70319	.71100	19
42	.65210	.75813	.66523	.74664	.67816	.73491	.69088	.72297	.70339	.71080	18
43	.65232	.75794	.66545	.74644	.67837	.73472	.69109	.72277	.70360	.71059	17
44	.65254	.75775	.66566	.74625	.67859	.73452	.69130	.72257	.70381	.71039	16
45	.65276	.75756	.66588	.74606	.67880	.73432	.69151	.72236	.70401	.71019	15
46	.65298	.75738	66610	.74586	.67901	.73413	.69172	.72216	.70422	.70998	14
47	.65320	.75719	.66632	.74567	.67923	.73393	.69193	.72196	.70443	.70978	13
48	.65342	.75700	.66653	.74548	.67944	.73373	.69214	.72176	.70463	.70957	12
49	.65364	.75680	.66675	.74528	.67965	.73353	.69235	.72156	.70484	.70937	11
50	.65386	.75661	.66697	.74509	.67987	.73333	.69256	.72136	.70505	.70916	10
51	.65408	.75642	.66718	.74489	.68008	.73314	.69277	.72116	.70525	.70896	9
52	.65430	.75623	.66740	.74470	.68029	.73294	.69298	.72095	.70546	.70875	8
53	.65452	.75604	.66762	.74451	.68051	.73274	.69319	.72075	.70567	.70855	7
54	.65474	.75585	.66783	.74431	.68072	.73254	.69340	.72055	.70587	.70834	6
55	.65496	.75566	.66805	.74412	.68093	.73234	.69361	.72035	.70608	.70813	5
56	.65518	.75547	.66827	.74392	.68115	.73215	.69382	.72015	.70628	.70793	4
57	.65540	.75528	.66848	.74373	.68136	.73195	.69403	.71995	.70649	.70772	3
58	.65562	.75509	.66870	.74353	.68157	.73175	.69424	.71974	.70670	.70752	2
59	.65584	.75490	.66891	.74334	.68179	.73155	.69445	.71954	.70690	.70731	1
60	.65606	.75471	.66913	.74314	.68200	.73135	.69466	.71934	.70711	.70711	0
	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	Cosine	Sine	
′	49°		48°		47°		46°		45°		′

NATURAL TANGENTS AND COTANGENTS

′	0°		1°		2°		3°		4°		′
	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	
0	.00000	Infinite	.01746	57.2900	.03492	28.6363	.05241	19.0811	.06993	14.3007	60
1	.00029	3437.75	.01775	56.3506	.03521	28.3994	.05270	18.9755	.07022	14.2411	59
2	.00058	1718.87	.01804	55.4415	.03550	28.1664	.05299	18.8711	.07051	14.1821	58
3	.00087	1145.92	.01833	54.5613	.03579	27.9372	.05328	18.7678	.07080	14.1235	57
4	.00116	859.436	.01862	53.7086	.03609	27.7117	.05357	18.6656	.07110	14.0655	56
5	.00145	687.549	.01891	52.8821	.03638	27.4899	.05387	18.5645	.07139	14.0079	55
6	.00175	572.957	.01920	52.0807	.03667	27.2715	.05416	18.4645	.07168	13.9507	54
7	.00204	491.106	.01949	51.3032	.03696	27.0566	.05445	18.3655	.07197	13.8940	53
8	.00233	429.718	.01978	50.5485	.03725	26.8450	.05474	18.2677	.07227	13.8378	52
9	.00262	381.971	.02007	49.8157	.03754	26.6367	.05503	18.1708	.07256	13.7821	51
10	.00291	343.774	.02036	49.1039	.03783	26.4316	.05533	18.0750	.07285	13.7267	50
11	.00320	312.521	.02066	48.4121	.03812	26.2296	.05562	17.9802	.07314	13.6719	49
12	.00349	286.478	.02095	47.7395	.03842	26.0307	.05591	17.8863	.07344	13.6174	48
13	.00378	264.441	.02124	47.0853	.03871	25.8348	.05620	17.7934	.07373	13.5634	47
14	.00407	245.552	.02153	46.4489	.03900	25.6418	.05649	17.7015	.07402	13.5098	46
15	.00436	229.182	.02182	45.8294	.03929	25.4517	.05678	17.6106	.07431	13.4566	45
16	.00465	214.858	.02211	45.2261	.03958	25.2644	.05708	17.5205	.07461	13.4039	44
17	.00495	202.219	.02240	44.6386	.03987	25.0798	.05737	17.4314	.07490	13.3515	43
18	.00524	190.984	.02269	44.0661	.04016	24.8978	.05766	17.3432	.07519	13.2996	42
19	.00553	180.932	.02298	43.5081	.04046	24.7185	.05795	17.2558	.07548	13.2480	41
20	.00582	171.885	.02328	42.9641	.04075	24.5418	.05824	17.1693	.07578	13.1969	40
21	.00611	163.700	.02357	42.4335	.04104	24.3675	.05854	17.0837	.07607	13.1461	39
22	.00640	156.259	.02386	41.9158	.04133	24.1957	.05883	16.9990	.07636	13.0958	38
23	.00669	149.465	.02415	41.4106	.04162	24.0263	.05912	16.9150	.07665	13.0458	37
24	.00698	143.237	.02444	40.9174	.04191	23.8593	.05941	16.8319	.07695	12.9962	36
25	.00727	137.507	.02473	40.4358	.04220	23.6945	.05970	16.7496	.07724	12.9469	35
26	.00756	132.219	.02502	39.9655	.04250	23.5321	.05999	16.6681	.07753	12.8981	34
27	.00785	127.321	.02531	39.5059	.04279	23.3718	.06029	16.5874	.07782	12.8496	33
28	.00815	122.774	.02560	39.0568	.04308	23.2137	.06058	16.5075	.07812	12.8014	32
29	.00844	118.540	.02589	38.6177	.04337	23.0577	.06087	16.4283	.07841	12.7536	31
30	.00873	114.589	.02619	38.1885	.04366	22.9038	.06116	16.3499	.07870	12.7062	30
31	.00902	110.892	.02648	37.7686	.04395	22.7519	.06145	16.2722	.07899	12.6591	29
32	.00931	107.426	.02677	37.3579	.04424	22.6020	.06175	16.1952	.07929	12.6124	28
33	.00960	104.171	.02706	36.9560	.04454	22.4541	.06204	16.1190	.07958	12.5660	27
34	.00989	101.107	.02735	36.5627	.04483	22.3081	.06233	16.0435	.07987	12.5199	26
35	.01018	98.2179	.02764	36.1776	.04512	22.1640	.06262	15.9687	.08017	12.4742	25
36	.01047	95.4895	.02793	35.8006	.04541	22.0217	.06291	15.8945	.08046	12.4288	24
37	.01076	92.9085	.02822	35.4313	.04570	21.8813	.06321	15.8211	.08075	12.3838	23
38	.01105	90.4633	.02851	35.0695	.04599	21.7426	.06350	15.7483	.08104	12.3390	22
39	.01135	88.1436	.02881	34.7151	.04628	21.6056	.06379	15.6762	.08134	12.2946	21
40	.01164	85.9398	.02910	34.3678	.04658	21.4704	.06408	15.6048	.08163	12.2505	20
41	.01193	83.8435	.02939	34.0273	.04687	21.3369	.06437	15.5340	.08192	12.2067	19
42	.01222	81.8470	.02968	33.6935	.04716	21.2049	.06467	15.4638	.08221	12.1632	18
43	.01251	79.9434	.02997	33.3662	.04745	21.0747	.06496	15.3943	.08251	12.1201	17
44	.01280	78.1263	.03026	33.0452	.04774	20.9460	.06525	15.3254	.08280	12.0772	16
45	.01309	76.3900	.03055	32.7303	.04803	20.8188	.06554	15.2571	.08309	12.0346	15
46	.01338	74.7292	.03084	32.4213	.04833	20.6932	.06584	15.1893	.08339	11.9923	14
47	.01367	73.1390	.03114	32.1181	.04862	20.5691	.06613	15.1222	.08368	11.9504	13
48	.01396	71.6151	.03143	31.8205	.04891	20.4465	.06642	15.0557	.08397	11.9087	12
49	.01425	70.1533	.03172	31.5284	.04920	20.3253	.06671	14.9898	.08427	11.8673	11
50	.01455	68.7501	.03201	31.2416	.04949	20.2056	.06700	14.9244	.08456	11.8262	10
51	.01484	67.4019	.03230	30.9599	.04978	20.0872	.06730	14.8596	.08485	11.7853	9
52	.01513	66.1055	.03259	30.6833	.05007	19.9702	.06759	14.7954	.08514	11.7448	8
53	.01542	64.8580	.03288	30.4116	.05037	19.8546	.06788	14.7317	.08544	11.7045	7
54	.01571	63.6567	.03317	30.1446	.05066	19.7403	.06817	14.6685	.08573	11.6645	6
55	.01600	62.4992	.03346	29.8823	.05095	19.6273	.06847	14.6059	.08602	11.6248	5
56	.01629	61.3829	.03376	29.6245	.05124	19.5156	.06876	14.5438	.08632	11.5853	4
57	.01658	60.3058	.03405	29.3711	.05153	19.4051	.06905	14.4823	.08661	11.5461	3
58	.01687	59.2659	.03434	29.1220	.05182	19.2959	.06934	14.4212	.08690	11.5072	2
59	.01716	58.2612	.03463	28.8771	.05212	19.1879	.06963	14.3607	.08720	11.4685	1
60	.01746	57.2900	.03492	28.6363	.05241	19.0811	.06993	14.3007	.08749	11.4301	0
	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	
′	89°		88°		87°		86°		85°		′

NATURAL TANGENTS AND COTANGENTS

′	5°		6°		7°		8°		9°		′
	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	
0	.08749	11.4301	.10510	9.51436	.12278	8.14435	.14054	7.11537	.15838	6.31375	60
1	.08778	11.3919	.10540	9.48781	.12308	8.12481	.14084	7.10038	.15868	6.30189	59
2	.08807	11.3540	.10569	9.46141	.12338	8.10536	.14113	7.08546	.15898	6.29007	58
3	.08837	11.3163	.10599	9.43515	.12367	8.08600	.14143	7.07059	.15928	6.27829	57
4	.08866	11.2789	.10628	9.40904	.12397	8.06674	.14173	7.05579	.15958	6.26655	56
5	.08895	11.2417	.10657	9.38307	.12426	8.04756	.14202	7.04105	.15988	6.25486	55
6	.08925	11.2048	.10687	9.35724	.12456	8.02848	.14232	7.02637	.16017	6.24321	54
7	.08954	11.1681	.10716	9.33155	.12485	8.00948	.14262	7.01174	.16047	6.23160	53
8	.08983	11.1316	.10746	9.30599	.12515	7.99058	.14291	6.99718	.16077	6.22003	52
9	.09013	11.0954	.10775	9.28058	.12544	7.97176	.14321	6.98268	.16107	6.20851	51
10	.09042	11.0594	.10805	9.25530	.12574	7.95302	.14351	6.96823	.16137	6.19703	50
11	.09071	11.0237	.10834	9.23016	.12603	7.93438	.14381	6.95385	.16167	6.18559	49
12	.09101	10.9882	.10863	9.20516	.12633	7.91582	.14410	6.93952	.16196	6.17419	48
13	.09130	10.9529	.10893	9.18028	.12662	7.89734	.14440	6.92525	.16226	6.16283	47
14	.09159	10.9178	.10922	9.15554	.12692	7.87895	.14470	6.91104	.16256	6.15151	46
15	.09189	10.8829	.10952	9.13093	.12722	7.86064	.14499	6.89688	.16286	6.14023	45
16	.09218	10.8483	.10981	9.10646	.12751	7.84242	.14529	6.88278	.16316	6.12899	44
17	.09247	10.8139	.11011	9.08211	.12781	7.82428	.14559	6.86874	.16346	6.11779	43
18	.09277	10.7797	.11040	9.05789	.12810	7.80622	.14588	6.85475	.16376	6.10664	42
19	.09306	10.7457	.11070	9.03379	.12840	7.78825	.14618	6.84082	.16405	6.09552	41
20	.09335	10.7119	.11099	9.00983	.12869	7.77035	.14648	6.82694	.16435	6.08444	40
21	.09365	10.6783	.11128	8.98598	.12899	7.75254	.14678	6.81312	.16465	6.07340	39
22	.09394	10.6450	.11158	8.96227	.12929	7.73480	.14707	6.79936	.16495	6.06240	38
23	.09423	10.6118	.11187	8.93867	.12958	7.71715	.14737	6.78564	.16525	6.05143	37
24	.09453	10.5789	.11217	8.91520	.12988	7.69957	.14767	6.77199	.16555	6.04051	36
25	.09482	10.5462	.11246	8.89185	.13017	7.68208	.14796	6.75838	.16585	6.02962	35
26	.09511	10.5136	.11276	8.86862	.13047	7.66466	.14826	6.74483	.16615	6.01878	34
27	.09541	10.4813	.11305	8.84551	.13076	7.64732	.14856	6.73133	.16645	6.00797	33
28	.09570	10.4491	.11335	8.82252	.13106	7.63005	.14886	6.71789	.16674	5.99720	32
29	.09600	10.4172	.11364	8.79964	.13136	7.61287	.14915	6.70450	.16704	5.98646	31
30	.09629	10.3854	.11394	8.77689	.13165	7.59575	.14945	6.69116	.16734	5.97576	30
31	.09658	10.3538	.11423	8.75425	.13195	7.57872	.14975	6.67787	.16764	5.96510	29
32	.09688	10.3224	.11452	8.73172	.13224	7.56176	.15005	6.66463	.16794	5.95448	28
33	.09717	10.2913	.11482	8.70931	.13254	7.54487	.15034	6.65144	.16824	5.94390	27
34	.09746	10.2602	.11511	8.68701	.13284	7.52806	.15064	6.63831	.16854	5.93335	26
35	.09776	10.2294	.11541	8.66482	.13313	7.51132	.15094	6.62523	.16884	5.92283	25
36	.09805	10.1988	.11570	8.64275	.13343	7.49465	.15124	6.61219	.16914	5.91236	24
37	.09834	10.1683	.11600	8.62078	.13372	7.47806	.15153	6.59921	.16944	5.90191	23
38	.09864	10.1381	.11629	8.59893	.13402	7.46154	.15183	6.58627	.16974	5.89151	22
39	.09893	10.1080	.11659	8.57718	.13432	7.44509	.15213	6.57339	.17004	5.88114	21
40	.09923	10.0780	.11688	8.55555	.13461	7.42871	.15243	6.56055	.17033	5.87080	20
41	.09952	10.0483	.11718	8.53402	.13491	7.41240	.15272	6.54777	.17063	5.86051	19
42	.09981	10.0187	.11747	8.51259	.13521	7.39616	.15302	6.53503	.17093	5.85024	18
43	.10011	9.98931	.11777	8.49128	.13550	7.37999	.15332	6.52234	.17123	5.84001	17
44	.10040	9.96007	.11806	8.47007	.13580	7.36389	.15362	6.50970	.17153	5.82982	16
45	.10069	9.93101	.11836	8.44896	.13609	7.34786	.15391	6.49710	.17183	5.81966	15
46	.10099	9.90211	.11865	8.42795	.13639	7.33190	.15421	6.48456	.17213	5.80953	14
47	.10128	9.87338	.11895	8.40705	.13669	7.31600	.15451	6.47206	.17243	5.79944	13
48	.10158	9.84482	.11924	8.38625	.13698	7.30018	.15481	6.45961	.17273	5.78938	12
49	.10187	9.81641	.11954	8.36555	.13728	7.28442	.15511	6.44720	.17303	5.77936	11
50	.10216	9.78817	.11983	8.34496	.13758	7.26873	.15540	6.43484	.17333	5.76937	10
51	.10246	9.76009	.12013	8.32446	.13787	7.25310	.15570	6.42253	.17363	5.75941	9
52	.10275	9.73217	.12042	8.30406	.13817	7.23754	.15600	6.41026	.17393	5.74949	8
53	.10305	9.70441	.12072	8.28376	.13846	7.22204	.15630	6.39804	.17423	5.73960	7
54	.10334	9.67680	.12101	8.26355	.13876	7.20661	.15660	6.38587	.17453	5.72974	6
55	.10363	9.64935	.12131	8.24345	.13906	7.19125	.15689	6.37374	.17483	5.71992	5
56	.10393	9.62205	.12160	8.22344	.13935	7.17594	.15719	6.36165	.17513	5.71013	4
57	.10422	9.59490	.12190	8.20352	.13965	7.16071	.15749	6.34961	.17543	5.70037	3
58	.10452	9.56791	.12219	8.18370	.13995	7.14553	.15779	6.33761	.17573	5.69064	2
59	.10481	9.54106	.12249	8.16398	.14024	7.13042	.15809	6.32566	.17603	5.68094	1
60	.10510	9.51436	.12278	8.14435	.14054	7.11537	.15838	6.31375	.17633	5.67128	0
	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	
′	84°		83°		82°		81°		80°		′

NATURAL TANGENTS AND COTANGENTS

′	10°		11°		12°		13°		14°		′
	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	
0	.17633	5.67128	.19438	5.14455	.21256	4.70463	.23087	4.33148	.24933	4.01078	60
1	.17663	5.66165	.19468	5.13658	.21286	4.69791	.23117	4.32573	.24964	4.00582	59
2	.17693	5.65205	.19498	5.12862	.21316	4.69121	.23148	4.32001	.24995	4.00086	58
3	.17723	5.64248	.19529	5.12069	.21347	4.68452	.23179	4.31430	.25026	3.99592	57
4	.17753	5.63295	.19559	5.11279	.21377	4.67786	.23209	4.30860	.25056	3.99099	56
5	.17783	5.62344	.19589	5.10490	.21408	4.67121	.23240	4.30291	.25087	3.98607	55
6	.17813	5.61397	.19619	5.09704	.21438	4.66458	.23271	4.29724	.25118	3.98117	54
7	.17843	5.60452	.19649	5.08921	.21469	4.65797	.23301	4.29159	.25149	3.97627	53
8	.17873	5.59511	.19680	5.08139	.21499	4.65138	.23332	4.28595	.25180	3.97139	52
9	.17903	5.58573	.19710	5.07360	.21529	4.64480	.23363	4.28032	.25211	3.96651	51
10	.17933	5.57638	.19740	5.06584	.21560	4.63825	.23393	4.27471	.25242	3.96165	50
11	.17963	5.56706	.19770	5.05809	.21590	4.63171	.23424	4.26911	.25273	3.95680	49
12	.17993	5.55777	.19801	5.05037	.21621	4.62518	.23455	4.26352	.25304	3.95196	48
13	.18023	5.54851	.19831	5.04267	.21651	4.61868	.23485	4.25795	.25335	3.94713	47
14	.18053	5.53927	.19861	5.03499	.21682	4.61219	.23516	4.25239	.25366	3.94232	46
15	.18083	5.53007	.19891	5.02734	.21712	4.60572	.23547	4.24685	.25397	3.93751	45
16	.18113	5.52090	.19921	5.01971	.21743	4.59927	.23578	4.24132	.25428	3.93271	44
17	.18143	5.51176	.19952	5.01210	.21773	4.59283	.23608	4.23580	.25459	3.92793	43
18	.18173	5.50264	.19982	5.00451	.21804	4.58641	.23639	4.23030	.25490	3.92316	42
19	.18203	5.49356	.20012	4.99695	.21834	4.58001	.23670	4.22481	.25521	3.91839	41
20	.18233	5.48451	.20042	4.98940	.21864	4.57363	.23700	4.21933	.25552	3.91364	40
21	.18263	5.47548	.20073	4.98188	.21895	4.56726	.23731	4.21387	.25583	3.90890	39
22	.18293	5.46648	.20103	4.97438	.21925	4.56091	.23762	4.20842	.25614	3.90417	38
23	.18323	5.45751	.20133	4.96690	.21956	4.55458	.23793	4.20298	.25645	3.89945	37
24	.18353	5.44857	.20164	4.95945	.21986	4.54826	.23823	4.19756	.25676	3.89474	36
25	.18384	5.43966	.20194	4.95201	.22017	4.54196	.23854	4.19215	.25707	3.89004	35
26	.18414	5.43077	.20224	4.94460	.22047	4.53568	.23885	4.18675	.25738	3.88536	34
27	.18444	5.42192	.20254	4.93721	.22078	4.52941	.23916	4.18137	.25769	3.88068	33
28	.18474	5.41309	.20285	4.92984	.22108	4.52316	.23946	4.17600	.25800	3.87601	32
29	.18504	5.40429	.20315	4.92249	.22139	4.51693	.23977	4.17064	.25831	3.87136	31
30	.18534	5.39552	.20345	4.91516	.22169	4.51071	.24008	4.16530	.25862	3.86671	30
31	.18564	5.38677	.20376	4.90785	.22200	4.50451	.24039	4.15997	.25893	3.86208	29
32	.18594	5.37805	.20406	4.90056	.22231	4.49832	.24069	4.15465	.25924	3.85745	28
33	.18624	5.36936	.20436	4.89330	.22261	4.49215	.24100	4.14934	.25955	3.85284	27
34	.18654	5.36070	.20466	4.88605	.22292	4.48600	.24131	4.14405	.25986	3.84824	26
35	.18684	5.35206	.20497	4.87882	.22322	4.47986	.24162	4.13877	.26017	3.84364	25
36	.18714	5.34345	.20527	4.87162	.22353	4.47374	.24193	4.13350	.26048	3.83906	24
37	.18745	5.33487	.20557	4.86444	.22383	4.46764	.24223	4.12825	.26079	3.83449	23
38	.18775	5.32631	.20588	4.85727	.22414	4.46155	.24254	4.12301	.26110	3.82992	22
39	.18805	5.31778	.20618	4.85013	.22444	4.45548	.24285	4.11778	.26141	3.82537	21
40	.18835	5.30928	.20648	4.84300	.22475	4.44942	.24316	4.11256	.26172	3.82083	20
41	.18865	5.30080	.20679	4.83590	.22505	4.44338	.24347	4.10736	.26203	3.81630	19
42	.18895	5.29235	.20709	4.82882	.22536	4.43735	.24377	4.10216	.26235	3.81177	18
43	.18925	5.28393	.20739	4.82175	.22567	4.43134	.24408	4.09699	.26266	3.80726	17
44	.18955	5.27553	.20770	4.81471	.22597	4.42534	.24439	4.09182	.26297	3.80276	16
45	.18986	5.26715	.20800	4.80769	.22628	4.41936	.24470	4.08666	.26328	3.79827	15
46	.19016	5.25880	.20830	4.80068	.22658	4.41340	.24501	4.08152	.26359	3.79378	14
47	.19046	5.25048	.20861	4.79370	.22689	4.40745	.24532	4.07639	.26390	3.78931	13
48	.19076	5.24218	.20891	4.78673	.22719	4.40152	.24562	4.07127	.26421	3.78485	12
49	.19106	5.23391	.20921	4.77978	.22750	4.39560	.24593	4.06616	.26452	3.78040	11
50	.19136	5.22566	.20952	4.77286	.22781	4.38969	.24624	4.06107	.26483	3.77595	10
51	.19166	5.21744	.20982	4.76595	.22811	4.38381	.24655	4.05599	.26515	3.77152	9
52	.19197	5.20925	.21013	4.75906	.22842	4.37793	.24686	4.05092	.26546	3.76709	8
53	.19227	5.20107	.21043	4.75219	.22872	4.37207	.24717	4.04586	.26577	3.76268	7
54	.19257	5.19293	.21073	4.74534	.22903	4.36623	.24747	4.04081	.26608	3.75828	6
55	.19287	5.18480	.21104	4.73851	.22934	4.36040	.24778	4.03578	.26639	3.75388	5
56	.19317	5.17671	.21134	4.73170	.22964	4.35459	.24809	4.03076	.26670	3.74950	4
57	.19347	5.16863	.21164	4.72490	.22995	4.34879	.24840	4.02574	.26701	3.74512	3
58	.19378	5.16058	.21195	4.71813	.23026	4.34300	.24871	4.02074	.26733	3.74075	2
59	.19408	5.15256	.21225	4.71137	.23056	4.33723	.24902	4.01576	.26764	3.73640	1
60	.19438	5.14455	.21256	4.70463	.23087	4.33148	.24933	4.01078	.26795	3.73205	0
′	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	′
	79°		78°		77°		76°		75°		

NATURAL TANGENTS AND COTANGENTS

′	15°		16°		17°		18°		19°		′
	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	
0	.26795	3.73205	.28675	3.48741	.30573	3.27085	.32492	3.07768	.34433	2.90421	60
1	.26826	3.72771	.28706	3.48359	.30605	3.26745	.32524	3.07464	.34465	2.90147	59
2	.26857	3.72338	.28738	3.47977	.30637	3.26406	.32556	3.07160	.34498	2.89873	58
3	.26888	3.71907	.28769	3.47596	.30669	3.26067	.32588	3.06857	.34530	2.89600	57
4	.26920	3.71476	.28800	3.47216	.30700	3.25729	.32621	3.06554	.34563	2.89327	56
5	.26951	3.71046	.28832	3.46837	.30732	3.25392	.32653	3.06252	.34596	2.89055	55
6	.26982	3.70616	.28864	3.46458	.30764	3.25055	.32685	3.05950	.34628	2.88783	54
7	.27013	3.70188	.28895	3.46080	.30796	3.24719	.32717	3.05649	.34661	2.88511	53
8	.27044	3.69761	.28927	3.45703	.30828	3.24383	.32749	3.05349	.34693	2.88240	52
9	.27076	3.69335	.28958	3.45327	.30860	3.24049	.32782	3.05049	.34726	2.87970	51
10	.27107	3.68909	.28990	3.44951	.30891	3.23714	.32814	3.04749	.34758	2.87700	50
11	.27138	3.68485	.29021	3.44576	.30923	3.23381	.32846	3.04450	.34791	2.87430	49
12	.27169	3.68061	.29053	3.44202	.30955	3.23048	.32878	3.04152	.34824	2.87161	48
13	.27201	3.67638	.29084	3.43829	.30987	3.22715	.32911	3.03854	.34856	2.86892	47
14	.27232	3.67217	.29116	3.43456	.31019	3.22384	.32943	3.03556	.34889	2.86624	46
15	.27263	3.66796	.29147	3.43084	.31051	3.22053	.32975	3.03260	.34922	2.86356	45
16	.27294	3.66376	.29179	3.42713	.31083	3.21722	.33007	3.02963	.34954	2.86089	44
17	.27326	3.65957	.29210	3.42343	.31115	3.21392	.33040	3.02667	.34987	2.85822	43
18	.27357	3.65538	.29242	3.41973	.31147	3.21063	.33072	3.02372	.35020	2.85555	42
19	.27388	3.65121	.29274	3.41604	.31178	3.20734	.33104	3.02077	.35052	2.85289	41
20	.27419	3.64705	.29305	3.41236	.31210	3.20406	.33136	3.01783	.35085	2.85023	40
21	.27451	3.64289	.29337	3.40869	.31242	3.20079	.33169	3.01489	.35118	2.84758	39
22	.27482	3.63874	.29368	3.40502	.31274	3.19752	.33201	3.01196	.35150	2.84494	38
23	.27513	3.63461	.29400	3.40136	.31306	3.19426	.33233	3.00903	.35183	2.84229	37
24	.27545	3.63048	.29432	3.39771	.31338	3.19100	.33266	3.00611	.35216	2.83965	36
25	.27576	3.62636	.29463	3.39406	.31370	3.18775	.33298	3.00319	.35248	2.83702	35
26	.27607	3.62224	.29495	3.39042	.31402	3.18451	.33330	3.00028	.35281	2.83439	34
27	.27638	3.61814	.29526	3.38679	.31434	3.18127	.33363	2.99738	.35314	2.83176	33
28	.27670	3.61405	.29558	3.38317	.31466	3.17804	.33395	2.99447	.35346	2.82914	32
29	.27701	3.60996	.29590	3.37955	.31498	3.17481	.33427	2.99158	.35379	2.82653	31
30	.27732	3.60588	.29621	3.37594	.31530	3.17159	.33460	2.98868	.35412	2.82391	30
31	.27764	3.60181	.29653	3.37234	.31562	3.16838	.33492	2.98580	.35445	2.82130	29
32	.27795	3.59775	.29685	3.36875	.31594	3.16517	.33524	2.98292	.35477	2.81870	28
33	.27826	3.59370	.29716	3.36516	.31626	3.16197	.33557	2.98004	.35510	2.81610	27
34	.27858	3.58966	.29748	3.36158	.31658	3.15877	.33589	2.97717	.35543	2.81350	26
35	.27889	3.58562	.29780	3.35800	.31690	3.15558	.33621	2.97430	.35576	2.81091	25
36	.27921	3.58160	.29811	3.35443	.31722	3.15240	.33654	2.97144	.35608	2.80833	24
37	.27952	3.57758	.29843	3.35087	.31754	3.14922	.33686	2.96858	.35641	2.80574	23
38	.27983	3.57357	.29875	3.34732	.31786	3.14605	.33718	2.96573	.35674	2.80316	22
39	.28015	3.56957	.29906	3.34377	.31818	3.14288	.33751	2.96288	.35707	2.80059	21
40	.28046	3.56557	.29938	3.34023	.31850	3.13972	.33783	2.96004	.35740	2.79802	20
41	.28077	3.56159	.29970	3.33670	.31882	3.13656	.33816	2.95721	.35772	2.79545	19
42	.28109	3.55761	.30001	3.33317	.31914	3.13341	.33848	2.95437	.35805	2.79289	18
43	.28140	3.55364	.30033	3.32965	.31946	3.13027	.33881	2.95155	.35838	2.79033	17
44	.28172	3.54968	.30065	3.32614	.31978	3.12713	.33913	2.94872	.35871	2.78778	16
45	.28203	3.54573	.30097	3.32264	.32010	3.12400	.33945	2.94591	.35904	2.78523	15
46	.28234	3.54179	.30128	3.31914	.32042	3.12087	.33978	2.94309	.35937	2.78269	14
47	.28266	3.53785	.30160	3.31565	.32074	3.11775	.34010	2.94028	.35969	2.78014	13
48	.28297	3.53393	.30192	3.31216	.32106	3.11464	.34043	2.93748	.36002	2.77761	12
49	.28329	3.53001	.30224	3.30868	.32139	3.11153	.34075	2.93468	.36035	2.77507	11
50	.28360	3.52609	.30255	3.30521	.32171	3.10842	.34108	2.93189	.36068	2.77254	10
51	.28391	3.52219	.30287	3.30174	.32203	3.10532	.34140	2.92910	.36101	2.77002	9
52	.28423	3.51829	.30319	3.29829	.32235	3.10223	.34173	2.92632	.36134	2.76750	8
53	.28454	3.51441	.30351	3.29483	.32267	3.09914	.34205	2.92354	.36167	2.76498	7
54	.28486	3.51053	.30382	3.29139	.32299	3.09606	.34238	2.92076	.36199	2.76247	6
55	.28517	3.50666	.30414	3.28795	.32331	3.09298	.34270	2.91799	.36232	2.75996	5
56	.28549	3.50279	.30446	3.28452	.32363	3.08991	.34303	2.91523	.36265	2.75746	4
57	.28580	3.49894	.30478	3.28109	.32396	3.08685	.34335	2.91246	.36298	2.75496	3
58	.28612	3.49509	.30509	3.27767	.32428	3.08379	.34368	2.90971	.36331	2.75246	2
59	.28643	3.49125	.30541	3.27426	.32460	3.08073	.34400	2.90696	.36364	2.74997	1
60	.28675	3.48741	.30573	3.27085	.32492	3.07768	.34433	2.90421	.36397	2.74748	0
	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	
′	74°		73°		72°		71°		70°		′

NATURAL TANGENTS AND COTANGENTS

′	20°		21°		22°		23°		24°		′
	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	
0	.36397	2.74748	.38386	2.60509	.40403	2.47509	.42447	2.35585	.44523	2.24604	60
1	.36430	2.74499	.38420	2.60283	.40436	2.47302	.42482	2.35395	.44558	2.24428	59
2	.36463	2.74251	.38453	2.60057	.40470	2.47095	.42516	2.35205	.44593	2.24252	58
3	.36496	2.74004	.38487	2.59831	.40504	2.46888	.42551	2.35015	.44627	2.24077	57
4	.36529	2.73756	.38520	2.59606	.40538	2.46682	.42585	2.34825	.44662	2.23902	56
5	.36562	2.73509	.38553	2.59381	.40572	2.46476	.42619	2.34636	.44697	2.23727	55
6	.36595	2.73263	.38587	2.59156	.40606	2.46270	.42654	2.34447	.44732	2.23553	54
7	.36628	2.73017	.38620	2.58932	.40640	2.46065	.42688	2.34258	.44767	2.23378	53
8	.36661	2.72771	.38654	2.58708	.40674	2.45860	.42722	2.34069	.44802	2.23204	52
9	.36694	2.72526	.38687	2.58484	.40707	2.45655	.42757	2.33881	.44837	2.23030	51
10	.36727	2.72281	.38721	2.58261	.40741	2.45451	.42791	2.33693	.44872	2.22857	50
11	.36760	2.72036	.38754	2.58038	.40775	2.45246	.42826	2.33505	.44907	2.22683	49
12	.36793	2.71792	.38787	2.57815	.40809	2.45043	.42860	2.33317	.44942	2.22510	48
13	.36826	2.71548	.38821	2.57593	.40843	2.44839	.42894	2.33130	.44977	2.22337	47
14	.36859	2.71305	.38854	2.57371	.40877	2.44636	.42929	2.32943	.45012	2.22164	46
15	.36892	2.71062	.38888	2.57150	.40911	2.44433	.42963	2.32756	.45047	2.21992	45
16	.36925	2.70819	.38921	2.56928	.40945	2.44230	.42998	2.32570	.45082	2.21819	44
17	.36958	2.70577	.38955	2.56707	.40979	2.44027	.43032	2.32383	.45117	2.21647	43
18	.36991	2.70335	.38988	2.56487	.41013	2.43825	.43067	2.32197	.45152	2.21475	42
19	.37024	2.70094	.39022	2.56266	.41047	2.43623	.43101	2.32012	.45187	2.21304	41
20	.37057	2.69853	.39055	2.56046	.41081	2.43422	.43136	2.31826	.45222	2.21132	40
21	.37090	2.69612	.39089	2.55827	.41115	2.43220	.43170	2.31641	.45257	2.20961	39
22	.37123	2.69371	.39122	2.55608	.41149	2.43019	.43205	2.31456	.45292	2.20790	38
23	.37157	2.69131	.39156	2.55389	.41183	2.42819	.43230	2.31271	.45327	2.20619	37
24	.37190	2.68892	.39190	2.55170	.41217	2.42618	.43274	2.31086	.45362	2.20449	36
25	.37223	2.68653	.39223	2.54952	.41251	2.42418	.43308	2.30902	.45397	2.20278	35
26	.37256	2.68414	.39257	2.54734	.41285	2.42218	.43343	2.30718	.45432	2.20108	34
27	.37289	2.68175	.39290	2.54516	.41319	2.42019	.43378	2.30534	.45467	2.19938	33
28	.37322	2.67937	.39324	2.54299	.41353	2.41819	.43412	2.30351	.45502	2.19769	32
29	.37355	2.67700	.39357	2.54082	.41387	2.41620	.43447	2.30167	.45538	2.19599	31
30	.37388	2.67462	.39391	2.53865	.41421	2.41421	.43481	2.29984	.45573	2.19430	30
31	.37422	2.67225	.39425	2.53648	.41455	2.41223	.43516	2.29801	.45608	2.19261	29
32	.37455	2.66989	.39458	2.53432	.41490	2.41025	.43550	2.29619	.45643	2.19092	28
33	.37488	2.66752	.39492	2.53217	.41524	2.40827	.43585	2.29437	.45678	2.18923	27
34	.37521	2.66516	.39526	2.53001	.41558	2.40629	.43620	2.29254	.45713	2.18755	26
35	.37554	2.66281	.39559	2.52786	.41592	2.40432	.43654	2.29073	.45748	2.18587	25
36	.37588	2.66046	.39593	2.52571	.41626	2.40235	.43689	2.28891	.45784	2.18419	24
37	.37621	2.65811	.39626	2.52357	.41660	2.40038	.43724	2.28710	.45819	2.18251	23
38	.37654	2.65576	.39660	2.52142	.41694	2.39841	.43758	2.28528	.45854	2.18084	22
39	.37687	2.65342	.39694	2.51929	.41728	2.39645	.43793	2.28348	.45889	2.17916	21
40	.37720	2.65109	.39727	2.51715	.41763	2.39449	.43828	2.28167	.45924	2.17749	20
41	.37754	2.64875	.39761	2.51502	.41797	2.39253	.43862	2.27987	.45960	2.17582	19
42	.37787	2.64642	.39795	2.51289	.41831	2.39058	.43897	2.27806	.45995	2.17416	18
43	.37820	2.64410	.39829	2.51076	.41865	2.38863	.43932	2.27626	.46030	2.17249	17
44	.37853	2.64177	.39862	2.50864	.41899	2.38668	.43966	2.27447	.46065	2.17083	16
45	.37887	2.63945	.39896	2.50652	.41933	2.38473	.44001	2.27267	.46101	2.16917	15
46	.37920	2.63714	.39930	2.50440	.41968	2.38279	.44036	2.27088	.46136	2.16751	14
47	.37953	2.63483	.39963	2.50229	.42002	2.38084	.44071	2.26909	.46171	2.16585	13
48	.37986	2.63252	.39997	2.50018	.42036	2.37891	.44105	2.26730	.46206	2.16420	12
49	.38020	2.63021	.40031	2.49807	.42070	2.37697	.44140	2.26552	.46242	2.16255	11
50	.38053	2.62791	.40065	2.49597	.42105	2.37504	.44175	2.26374	.46277	2.16090	10
51	.38086	2.62561	.40098	2.49386	.42139	2.37311	.44210	2.26196	.46312	2.15925	9
52	.38120	2.62332	.40132	2.49177	.42173	2.37118	.44244	2.26018	.46348	2.15760	8
53	.38153	2.62103	.40166	2.48967	.42207	2.36925	.44279	2.25840	.46383	2.15596	7
54	.38186	2.61874	.40200	2.48758	.42242	2.36733	.44314	2.25663	.46418	2.15432	6
55	.38220	2.61646	.40234	2.48549	.42276	2.36541	.44349	2.25486	.46454	2.15268	5
56	.38253	2.61418	.40267	2.48340	.42310	2.36349	.44384	2.25309	.46489	2.15104	4
57	.38286	2.61190	.40301	2.48132	.42345	2.36158	.44418	2.25132	.46525	2.14940	3
58	.38320	2.60963	.40335	2.47924	.42379	2.35967	.44453	2.24956	.46560	2.14777	2
59	.38353	2.60736	.40369	2.47716	.42413	2.35776	.44488	2.24780	.46595	2.14614	1
60	.38386	2.60509	.40403	2.47509	.42447	2.35585	.44523	2.24604	.46631	2.14451	0
′	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	′
	69°		68°		67°		66°		65°		

NATURAL TANGENTS AND COTANGENTS

′	25°		26°		27°		28°		29°		′
	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	
0	.46631	2.14451	.48773	2.05030	.50953	1.96261	.53171	1.88073	.55431	1.80405	60
1	.46666	2.14288	.48809	2.04879	.50989	1.96120	.53208	1.87941	.55469	1.80281	59
2	.46702	2.14125	.48845	2.04728	.51026	1.95979	.53246	1.87809	.55507	1.80158	58
3	.46737	2.13963	.48881	2.04577	.51063	1.95838	.53283	1.87677	.55545	1.80034	57
4	.46772	2.13801	.48917	2.04426	.51099	1.95698	.53320	1.87546	.55583	1.79911	56
5	.46808	2.13639	.48953	2.04276	.51136	1.95557	.53358	1.87415	.55621	1.79788	55
6	.46843	2.13477	.48989	2.04125	.51173	1.95417	.53395	1.87283	.55659	1.79665	54
7	.46879	2.13316	.49026	2.03975	.51209	1.95277	.53432	1.87152	.55697	1.79542	53
8	.46914	2.13154	.49062	2.03825	.51246	1.95137	.53470	1.87021	.55736	1.79419	52
9	.46950	2.12993	.49098	2.03675	.51283	1.94997	.53507	1.86891	.55774	1.79296	51
10	.46985	2.12832	.49134	2.03526	.51319	1.94858	.53545	1.86760	.55812	1.79174	50
11	.47021	2.12671	.49170	2.03376	.51356	1.94718	.53582	1.86630	.55850	1.79051	49
12	.47056	2.12511	.49206	2.03227	.51393	1.94579	.53620	1.86499	.55888	1.78929	48
13	.47092	2.12350	.49242	2.03078	.51430	1.94440	.53657	1.86369	.55926	1.78807	47
14	.47128	2.12190	.49278	2.02929	.51467	1.94301	.53694	1.86239	.55964	1.78685	46
15	.47163	2.12030	.49315	2.02780	.51503	1.94162	.53732	1.86109	.56003	1.78563	45
16	.47199	2.11871	.49351	2.02631	.51540	1.94023	.53769	1.85979	.56041	1.78441	44
17	.47234	2.11711	.49387	2.02483	.51577	1.93885	.53807	1.85850	.56079	1.78319	43
18	.47270	2.11552	.49423	2.02335	.51614	1.93746	.53844	1.85720	.56117	1.78198	42
19	.47305	2.11392	.49459	2.02187	.51651	1.93608	.53882	1.85591	.56156	1.78077	41
20	.47341	2.11233	.49495	2.02039	.51688	1.93470	.53920	1.85462	.56194	1.77955	40
21	.47377	2.11075	.49532	2.01891	.51724	1.93332	.53957	1.85333	.56232	1.77834	39
22	.47412	2.10916	.49568	2.01743	.51761	1.93195	.53995	1.85204	.56270	1.77713	38
23	.47448	2.10758	.49604	2.01596	.51798	1.93057	.54032	1.85075	.56309	1.77592	37
24	.47483	2.10600	.49640	2.01449	.51835	1.92920	.54070	1.84946	.56347	1.77471	36
25	.47519	2.10442	.49677	2.01302	.51872	1.92782	.54107	1.84818	.56385	1.77351	35
26	.47555	2.10284	.49713	2.01155	.51909	1.92645	.54145	1.84689	.56424	1.77230	34
27	.47590	2.10126	.49749	2.01008	.51946	1.92508	.54183	1.84561	.56462	1.77110	33
28	.47626	2.09969	.49786	2.00862	.51983	1.92371	.54220	1.84433	.56501	1.76990	32
29	.47662	2.09811	.49822	2.00715	.52020	1.92235	.54258	1.84305	.56539	1.76869	31
30	.47698	2.09654	.49858	2.00569	.52057	1.92098	.54296	1.84177	.56577	1.76749	30
31	.47733	2.09498	.49894	2.00423	.52094	1.91962	.54333	1.84049	.56616	1.76629	29
32	.47769	2.09341	.49931	2.00277	.52131	1.91826	.54371	1.83922	.56654	1.76510	28
33	.47805	2.09184	.49967	2.00131	.52168	1.91690	.54409	1.83794	.56693	1.76390	27
34	.47840	2.09028	.50004	1.99986	.52205	1.91554	.54446	1.83667	.56731	1.76271	26
35	.47876	2.08872	.50040	1.99841	.52242	1.91418	.54484	1.83540	.56769	1.76151	25
36	.47912	2.08716	.50076	1.99695	.52279	1.91282	.54522	1.83413	.56808	1.76032	24
37	.47948	2.08560	.50113	1.99550	.52316	1.91147	.54560	1.83286	.56846	1.75913	23
38	.47984	2.08405	.50149	1.99406	.52353	1.91012	.54597	1.83159	.56885	1.75794	22
39	.48019	2.08250	.50185	1.99261	.52390	1.90876	.54635	1.83033	.56923	1.75675	21
40	.48055	2.08094	.50222	1.99116	.52427	1.90741	.54673	1.82906	.56962	1.75556	20
41	.48091	2.07939	.50258	1.98972	.52464	1.90607	.54711	1.82780	.57000	1.75437	19
42	.48127	2.07785	.50295	1.98828	.52501	1.90472	.54748	1.82654	.57039	1.75319	18
43	.48163	2.07630	.50331	1.98684	.52538	1.90337	.54786	1.82528	.57078	1.75200	17
44	.48198	2.07476	.50368	1.98540	.52575	1.90203	.54824	1.82402	.57116	1.75082	16
45	.48234	2.07321	.50404	1.98396	.52613	1.90069	.54862	1.82276	.57155	1.74964	15
46	.48270	2.07167	.50441	1.98253	.52650	1.89935	.54900	1.82150	.57193	1.74846	14
47	.48306	2.07014	.50477	1.98110	.52687	1.89801	.54938	1.82025	.57232	1.74728	13
48	.48342	2.06860	.50514	1.97966	.52724	1.89667	.54975	1.81899	.57271	1.74610	12
49	.48378	2.06706	.50550	1.97823	.52761	1.89533	.55013	1.81774	.57309	1.74492	11
50	.48414	2.06553	.50587	1.97681	.52798	1.89400	.55051	1.81649	.57348	1.74375	10
51	.48450	2.06400	.50623	1.97538	.52836	1.89266	.55089	1.81524	.57386	1.74257	9
52	.48486	2.06247	.50660	1.97395	.52873	1.89133	.55127	1.81399	.57425	1.74140	8
53	.48521	2.06094	.50696	1.97253	.52910	1.89000	.55165	1.81274	.57464	1.74022	7
54	.48557	2.05942	.50733	1.97111	.52947	1.88867	.55203	1.81150	.57503	1.73905	6
55	.48593	2.05790	.50769	1.96969	.52985	1.88734	.55241	1.81025	.57541	1.73788	5
56	.48629	2.05637	.50806	1.96827	.53022	1.88602	.55279	1.80901	.57580	1.73671	4
57	.48665	2.05485	.50843	1.96685	.53059	1.88469	.55317	1.80777	.57619	1.73555	3
58	.48701	2.05333	.50879	1.96544	.53096	1.88337	.55355	1.80653	.57657	1.73438	2
59	.48737	2.05182	.50916	1.96402	.53134	1.88205	.55393	1.80529	.57696	1.73321	1
60	.48773	2.05030	.50953	1.96261	.53171	1.88073	.55431	1.80405	.57735	1.73205	0
′	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	′
	64°		63°		62°		61°		60°		

NATURAL TANGENTS AND COTANGENTS

′	30°		31°		32°		33°		34°		′
	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	
0	.57735	1.73205	.60086	1.66428	.62487	1.60033	.64941	1.53986	.67451	1.48256	60
1	.57774	1.73089	.60126	1.66318	.62527	1.59930	.64982	1.53888	.67493	1.48163	59
2	.57813	1.72973	.60165	1.66209	.62568	1.59826	.65024	1.53791	.67536	1.48070	58
3	.57851	1.72857	.60205	1.66099	.62608	1.59723	.65065	1.53693	.67578	1.47977	57
4	.57890	1.72741	.60245	1.65990	.62649	1.59620	.65106	1.53595	.67620	1.47885	56
5	.57929	1.72625	.60284	1.65881	.62689	1.59517	.65148	1.53497	.67663	1.47792	55
6	.57968	1.72509	.60324	1.65772	.62730	1.59414	.65189	1.53400	.67705	1.47699	54
7	.58007	1.72393	.60364	1.65663	.62770	1.59311	.65231	1.53302	.67748	1.47607	53
8	.58046	1.72278	.60403	1.65554	.62811	1.59208	.65272	1.53205	.67790	1.47514	52
9	.58085	1.72163	.60443	1.65445	.62852	1.59105	.65314	1.53107	.67832	1.47422	51
10	.58124	1.72047	.60483	1.65337	.62892	1.59002	.65355	1.53010	.67875	1.47330	50
11	.58162	1.71932	.60522	1.65228	.62933	1.58900	.65397	1.52913	.67917	1.47238	49
12	.58201	1.71817	.60562	1.65120	.62973	1.58797	.65438	1.52816	.67960	1.47146	48
13	.58240	1.71702	.60602	1.65011	.63014	1.58695	.65480	1.52719	.68002	1.47053	47
14	.58279	1.71588	.60642	1.64903	.63055	1.58593	.65521	1.52622	.68045	1.46962	46
15	.58318	1.71473	.60681	1.64795	.63095	1.58490	.65563	1.52525	.68088	1.46870	45
16	.58357	1.71358	.60721	1.64687	.63136	1.58388	.65604	1.52429	.68130	1.46778	44
17	.58396	1.71244	.60761	1.64579	.63177	1.58286	.65646	1.52332	.68173	1.46686	43
18	.58435	1.71129	.60801	1.64471	.63217	1.58184	.65688	1.52235	.68215	1.46595	42
19	.58474	1.71015	.60841	1.64363	.63258	1.58083	.65729	1.52139	.68258	1.46503	41
20	.58513	1.70901	.60881	1.64256	.63299	1.57981	.65771	1.52043	.68301	1.46411	40
21	.58552	1.70787	.60921	1.64148	.63340	1.57879	.65813	1.51946	.68343	1.46320	39
22	.58591	1.70673	.60960	1.64041	.63380	1.57778	.65854	1.51850	.68386	1.46229	38
23	.58631	1.70560	.61000	1.63934	.63421	1.57676	.65896	1.51754	.68429	1.46137	37
24	.58670	1.70446	.61040	1.63826	.63462	1.57575	.65938	1.51658	.68471	1.46046	36
25	.58709	1.70332	.61080	1.63719	.63503	1.57474	.65980	1.51562	.68514	1.45955	35
26	.58748	1.70219	.61120	1.63612	.63544	1.57372	.66021	1.51466	.68557	1.45864	34
27	.58787	1.70106	.61160	1.63505	.63584	1.57271	.66063	1.51370	.68600	1.45773	33
28	.58826	1.69992	.61200	1.63398	.63625	1.57170	.66105	1.51275	.68642	1.45682	32
29	.58865	1.69879	.61240	1.63292	.63666	1.57069	.66147	1.51179	.68685	1.45592	31
30	.58905	1.69766	.61280	1.63185	.63707	1.56969	.66189	1.51084	.68728	1.45501	30
31	.58944	1.69653	.61320	1.63079	.63748	1.56868	.66230	1.50988	.68771	1.45410	29
32	.58983	1.69541	.61360	1.62972	.63789	1.56767	.66272	1.50893	.68814	1.45320	28
33	.59022	1.69428	.61400	1.62866	.63830	1.56667	.66314	1.50797	.68857	1.45229	27
34	.59061	1.69316	.61440	1.62760	.63871	1.56566	.66356	1.50702	.68900	1.45139	26
35	.59101	1.69203	.61480	1.62654	.63912	1.56466	.66398	1.50607	.68942	1.45049	25
36	.59149	1.69091	.61520	1.62548	.63953	1.56366	.66440	1.50512	.68985	1.44958	24
37	.59179	1.68979	.61561	1.62442	.63994	1.56265	.66482	1.50417	.69028	1.44868	23
38	.59218	1.68866	.61601	1.62336	.64035	1.56165	.66524	1.50322	.69071	1.44778	22
39	.59258	1.68754	.61641	1.62230	.64076	1.56065	.66566	1.50228	.69114	1.44688	21
40	.59297	1.68643	.61681	1.62125	.64117	1.55966	.66608	1.50133	.69157	1.44598	20
41	.59336	1.68531	.61721	1.62019	.64158	1.55866	.66650	1.50038	.69200	1.44508	19
42	.59376	1.68419	.61761	1.61914	.64199	1.55766	.66692	1.49944	.69243	1.44418	18
43	.59415	1.68308	.61801	1.61808	.64240	1.55666	.66734	1.49849	.69286	1.44329	17
44	.59454	1.68196	.61842	1.61703	.64281	1.55567	.66776	1.49755	.69329	1.44239	16
45	.59494	1.68085	.61882	1.61598	.64322	1.55467	.66818	1.49661	.69372	1.44149	15
46	.59533	1.67974	.61922	1.61493	.64363	1.55368	.66860	1.49566	.69416	1.44060	14
47	.59573	1.67863	.61962	1.61388	.64404	1.55269	.66902	1.49472	.69459	1.43970	13
48	.59612	1.67752	.62003	1.61283	.64446	1.55170	.66944	1.49378	.69502	1.43881	12
49	.59651	1.67641	.62043	1.61179	.64487	1.55071	.66986	1.49284	.69545	1.43792	11
50	.59691	1.67530	.62083	1.61074	.64528	1.54972	.67028	1.49190	.69588	1.43703	10
51	.59730	1.67419	.62124	1.60970	.64569	1.54873	.67071	1.49097	.69631	1.43614	9
52	.59770	1.67309	.62164	1.60865	.64610	1.54774	.67113	1.49003	.69675	1.43525	8
53	.59809	1.67198	.62204	1.60761	.64652	1.54675	.67155	1.48909	.69718	1.43436	7
54	.59849	1.67088	.62245	1.60657	.64693	1.54576	.67197	1.48816	.69761	1.43347	6
55	.59888	1.66978	.62285	1.60553	.64734	1.54478	.67239	1.48722	.69804	1.43258	5
56	.59928	1.66867	.62325	1.60449	.64775	1.54379	.67282	1.48629	.69847	1.43169	4
57	.59967	1.66757	.62366	1.60345	.64817	1.54281	.67324	1.48536	.69891	1.43080	3
58	.60007	1.66647	.62406	1.60241	.64858	1.54183	.67366	1.48442	.69934	1.42992	2
59	.60046	1.66538	.62446	1.60137	.64899	1.54085	.67409	1.48349	.69977	1.42903	1
60	.60086	1.66428	.62487	1.60033	.64941	1.53986	.67451	1.48256	.70021	1.42815	0
	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	
′	59°		58°		57°		56°		55°		′

NATURAL TANGENTS AND COTANGENTS

′	35°		36°		37°		38°		39°		′
	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	
0	.70021	1.42815	.72654	1.37638	.75355	1.32704	.78129	1.27994	.80978	1.23490	60
1	.70064	1.42726	.72699	1.37554	.75401	1.32624	.78175	1.27917	.81027	1.23416	59
2	.70107	1.42638	.72743	1.37470	.75447	1.32544	.78222	1.27841	.81075	1.23343	58
3	.70151	1.42550	.72788	1.37386	.75492	1.32464	.78269	1.27764	.81123	1.23270	57
4	.70194	1.42462	.72832	1.37302	.75538	1.32384	.78316	1.27688	.81171	1.23196	56
5	.70238	1.42374	.72877	1.37218	.75584	1.32304	.78363	1.27611	.81220	1.23123	55
6	.70281	1.42286	.72921	1.37134	.75629	1.32224	.78410	1.27535	.81268	1.23050	54
7	.70325	1.42198	.72966	1.37050	.75675	1.32144	.78457	1.27458	.81316	1.22977	53
8	.70368	1.42110	.73010	1.36967	.75721	1.32064	.78504	1.27382	.81364	1.22904	52
9	.70412	1.42022	.73055	1.36883	.75767	1.31984	.78551	1.27306	.81413	1.22831	51
10	.70455	1.41934	.73100	1.36800	.75812	1.31904	.78598	1.27230	.81461	1.22758	50
11	.70499	1.41847	.73144	1.36716	.75858	1.31825	.78645	1.27153	.81510	1.22685	49
12	.70542	1.41759	.73189	1.36633	.75904	1.31745	.78692	1.27077	.81558	1.22612	48
13	.70586	1.41672	.73234	1.36549	.75950	1.31666	.78739	1.27001	.81606	1.22539	47
14	.70629	1.41584	.73278	1.36466	.75996	1.31586	.78786	1.26925	.81655	1.22467	46
15	.70673	1.41497	.73323	1.36383	.76042	1.31507	.78834	1.26849	.81703	1.22394	45
16	.70717	1.41409	.73368	1.36300	.76088	1.31427	.78881	1.26774	.81752	1.22321	44
17	.70760	1.41322	.73413	1.36217	.76134	1.31348	.78928	1.26698	.81800	1.22249	43
18	.70804	1.41235	.73457	1.36134	.76180	1.31269	.78975	1.26622	.81849	1.22176	42
19	.70848	1.41148	.73502	1.36051	.76226	1.31190	.79022	1.26546	.81898	1.22104	41
20	.70891	1.41061	.73547	1.35968	.76272	1.31110	.79070	1.26471	.81946	1.22031	40
21	.70935	1.40974	.73592	1.35885	.76318	1.31031	.79117	1.26395	.81995	1.21959	39
22	.70979	1.40887	.73637	1.35802	.76364	1.30952	.79164	1.26319	.82044	1.21886	38
23	.71023	1.40800	.73681	1.35719	.76410	1.30873	.79212	1.26244	.82092	1.21814	37
24	.71066	1.40714	.73726	1.35637	.76456	1.30795	.79259	1.26169	.82141	1.21742	36
25	.71110	1.40627	.73771	1.35554	.76502	1.30716	.79306	1.26093	.82190	1.21670	35
26	.71154	1.40540	.73816	1.35472	.76548	1.30637	.79354	1.26018	.82238	1.21598	34
27	.71198	1.40454	.73861	1.35389	.76594	1.30558	.79401	1.25943	.82287	1.21526	33
28	.71242	1.40367	.73906	1.35307	.76640	1.30480	.79449	1.25867	.82336	1.21454	32
29	.71285	1.40281	.73951	1.35224	.76686	1.30401	.79496	1.25792	.82385	1.21382	31
30	.71329	1.40195	.73996	1.35142	.76733	1.30323	.79544	1.25717	.82434	1.21310	30
31	.71373	1.40109	.74041	1.35060	.76779	1.30244	.79591	1.25642	.82483	1.21238	29
32	.71417	1.40022	.74086	1.34978	.76825	1.30166	.79639	1.25567	.82531	1.21166	28
33	.71461	1.39936	.74131	1.34896	.76871	1.30087	.79686	1.25492	.82580	1.21094	27
34	.71505	1.39850	.74176	1.34814	.76918	1.30009	.79734	1.25417	.82629	1.21023	26
35	.71549	1.39764	.74221	1.34732	.76964	1.29931	.79781	1.25343	.82678	1.20951	25
36	.71593	1.39679	.74267	1.34650	.77010	1.29853	.79829	1.25268	.82727	1.20879	24
37	.71637	1.39593	.74312	1.34568	.77057	1.29775	.79877	1.25193	.82776	1.20808	23
38	.71681	1.39507	.74357	1.34487	.77103	1.29696	.79924	1.25118	.82825	1.20736	22
39	.71725	1.39421	.74402	1.34405	.77149	1.29618	.79972	1.25044	.82874	1.20665	21
40	.71769	1.39336	.74447	1.34323	.77196	1.29541	.80020	1.24969	.82923	1.20593	20
41	.71813	1.39250	.74492	1.34242	.77242	1.29463	.80067	1.24895	.82972	1.20522	19
42	.71857	1.39165	.74538	1.34160	.77289	1.29385	.80115	1.24820	.83022	1.20451	18
43	.71901	1.39079	.74583	1.34079	.77335	1.29307	.80163	1.24746	.83071	1.20379	17
44	.71946	1.38994	.74628	1.33998	.77382	1.29229	.80211	1.24672	.83120	1.20308	16
45	.71990	1.38909	.74674	1.33916	.77428	1.29152	.80258	1.24597	.83169	1.20237	15
46	.72034	1.38824	.74719	1.33835	.77475	1.29074	.80306	1.24523	.83218	1.20166	14
47	.72078	1.38738	.74764	1.33754	.77521	1.28997	.80354	1.24449	.83268	1.20095	13
48	.72122	1.38653	.74810	1.33673	.77568	1.28919	.80402	1.24375	.83317	1.20024	12
49	.72167	1.38568	.74855	1.33592	.77615	1.28842	.80450	1.24301	.83366	1.19953	11
50	.72211	1.38484	.74900	1.33511	.77661	1.28764	.80498	1.24227	.83415	1.19882	10
51	.72255	1.38399	.74946	1.33430	.77708	1.28687	.80546	1.24153	.83465	1.19811	9
52	.72299	1.38314	.74991	1.33349	.77754	1.28610	.80594	1.24079	.83514	1.19740	8
53	.72344	1.38229	.75037	1.33268	.77801	1.28533	.80642	1.24005	.83564	1.19669	7
54	.72388	1.38145	.75082	1.33187	.77848	1.28456	.80690	1.23931	.83613	1.19599	6
55	.72432	1.38060	.75128	1.33107	.77895	1.28379	.80738	1.23858	.83662	1.19528	5
56	.72477	1.37976	.75173	1.33026	.77941	1.28302	.80786	1.23784	.83712	1.19457	4
57	.72521	1.37891	.75219	1.32946	.77988	1.28225	.80834	1.23710	.83761	1.19387	3
58	.72565	1.37807	.75264	1.32865	.78035	1.28148	.80882	1.23637	.83811	1.19316	2
59	.72610	1.37722	.75310	1.32785	.78082	1.28071	.80930	1.23563	.83860	1.19246	1
60	.72654	1.37638	.75355	1.32704	.78129	1.27994	.80978	1.23490	.83910	1.19175	0
	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	
′	54°		53°		52°		51°		50°		′

NATURAL TANGENTS AND COTANGENTS

′	40°		41°		42°		43°		44°		′
	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	
0	.83910	1.19175	.86929	1.15037	.90040	1.11061	.93252	1.07237	.96569	1.03553	60
1	.83960	1.19105	.86980	1.14969	.90093	1.10996	.93306	1.07174	.96625	1.03493	59
2	.84009	1.19035	.87031	1.14902	.90146	1.10931	.93360	1.07112	.96681	1.03433	58
3	.84059	1.18964	.87082	1.14834	.90199	1.10867	.93415	1.07049	.96738	1.03372	57
4	.84108	1.18894	.87133	1.14767	.90251	1.10802	.93469	1.06987	.96794	1.03312	56
5	.84158	1.18824	.87184	1.14699	.90304	1.10737	.93524	1.06925	.96850	1.03252	55
6	.84208	1.18754	.87236	1.14632	.90357	1.10672	.93578	1.06862	.96907	1.03192	54
7	.84258	1.18684	.87287	1.14565	.90410	1.10607	.93633	1.06800	.96963	1.03132	53
8	.84307	1.18614	.87338	1.14498	.90463	1.10543	.93688	1.06738	.97020	1.03072	52
9	.84357	1.18544	.87389	1.14430	.90516	1.10478	.93742	1.06676	.97076	1.03012	51
10	.84407	1.18474	.87441	1.14363	.90569	1.10414	.93797	1.06613	.97133	1.02952	50
11	.84457	1.18404	.87492	1.14296	.90621	1.10349	.93852	1.06551	.97189	1.02892	49
12	.84507	1.18334	.87543	1.14229	.90674	1.10285	.93906	1.06489	.97246	1.02832	48
13	.84556	1.18264	.87595	1.14162	.90727	1.10220	.93961	1.06427	.97302	1.02772	47
14	.84606	1.18194	.87646	1.14095	.90781	1.10156	.94016	1.06365	.97359	1.02713	46
15	.84656	1.18125	.87698	1.14028	.90834	1.10091	.94071	1.06303	.97416	1.02653	45
16	.84706	1.18055	.87749	1.13961	.90887	1.10027	.94125	1.06241	.97472	1.02593	44
17	.84756	1.17986	.87801	1.13894	.90940	1.09963	.94180	1.06179	.97529	1.02533	43
18	.84806	1.17916	.87852	1.13828	.90993	1.09899	.94235	1.06117	.97586	1.02474	42
19	.84856	1.17846	.87904	1.13761	.91046	1.09834	.94290	1.06056	.97643	1.02414	41
20	.84906	1.17777	.87955	1.13694	.91099	1.09770	.94345	1.05994	.97700	1.02355	40
21	.84956	1.17708	.88007	1.13627	.91153	1.09706	.94400	1.05932	.97756	1.02295	39
22	.85006	1.17638	.88059	1.13561	.91206	1.09642	.94455	1.05870	.97813	1.02236	38
23	.85057	1.17569	.88110	1.13494	.91259	1.09578	.94510	1.05809	.97870	1.02176	37
24	.85107	1.17500	.88162	1.13428	.91313	1.09514	.94565	1.05747	.97927	1.02117	36
25	.85157	1.17430	.88214	1.13361	.91366	1.09450	.94620	1.05685	.97984	1.02057	35
26	.85207	1.17361	.88265	1.13295	.91419	1.09386	.94676	1.05624	.98041	1.01998	34
27	.85257	1.17292	.88317	1.13228	.91473	1.09322	.94731	1.05562	.98098	1.01939	33
28	.85308	1.17223	.88369	1.13162	.91526	1.09258	.94786	1.05501	.98155	1.01879	32
29	.85358	1.17154	.88421	1.13096	.91580	1.09195	.94841	1.05439	.98213	1.01820	31
30	.85408	1.17085	.88473	1.13029	.91633	1.09131	.94896	1.05378	.98270	1.01761	30
31	.85458	1.17016	.88524	1.12963	.91687	1.09067	.94952	1.05317	.98327	1.01702	29
32	.85509	1.16947	.88576	1.12897	.91740	1.09003	.95007	1.05255	.98384	1.01642	28
33	.85559	1.16878	.88628	1.12831	.91794	1.08940	.95062	1.05194	.98441	1.01583	27
34	.85609	1.16809	.88680	1.12765	.91847	1.08876	.95118	1.05133	.98499	1.01524	26
35	.85660	1.16741	.88732	1.12699	.91901	1.08813	.95173	1.05072	.98556	1.01465	25
36	.85710	1.16672	.88784	1.12633	.91955	1.08749	.95229	1.05010	.98613	1.01406	24
37	.85761	1.16603	.88836	1.12567	.92008	1.08686	.95284	1.04949	.98671	1.01347	23
38	.85811	1.16535	.88888	1.12501	.92062	1.08622	.95340	1.04888	.98728	1.01288	22
39	.85862	1.16466	.88940	1.12435	.92116	1.08559	.95395	1.04827	.98786	1.01229	21
40	.85912	1.16398	.88992	1.12369	.92170	1.08496	.95451	1.04766	.98843	1.01170	20
41	.85963	1.16329	.89045	1.12303	.92224	1.08432	.95506	1.04705	.98901	1.01112	19
42	.86014	1.16261	.89097	1.12238	.92277	1.08369	.95562	1.04644	.98958	1.01053	18
43	.86064	1.16192	.89149	1.12172	.92331	1.08306	.95618	1.04583	.99016	1.00994	17
44	.86115	1.16124	.89201	1.12106	.92385	1.08243	.95673	1.04522	.99073	1.00935	16
45	.86166	1.16056	.89253	1.12041	.92439	1.08179	.95729	1.04461	.99131	1.00876	15
46	.86216	1.15987	.89306	1.11975	.92493	1.08116	.95785	1.04401	.99189	1.00818	14
47	.86267	1.15919	.89358	1.11909	.92547	1.08053	.95841	1.04340	.99247	1.00759	13
48	.86318	1.15851	.89410	1.11844	.92601	1.07990	.95897	1.04279	.99304	1.00701	12
49	.86368	1.15783	.89463	1.11778	.92655	1.07927	.95952	1.04218	.99362	1.00642	11
50	.86419	1.15715	.89515	1.11713	.92709	1.07864	.96008	1.04158	.99420	1.00583	10
51	.86470	1.15647	.89567	1.11648	.92763	1.07801	.96064	1.04097	.99478	1.00525	9
52	.86521	1.15579	.89620	1.11582	.92817	1.07738	.96120	1.04036	.99536	1.00467	8
53	.86572	1.15511	.89672	1.11517	.92872	1.07676	.96176	1.03976	.99594	1.00408	7
54	.86623	1.15443	.89725	1.11452	.92926	1.07613	.96232	1.03915	.99652	1.00350	6
55	.86674	1.15375	.89777	1.11387	.92980	1.07550	.96288	1.03855	.99710	1.00291	5
56	.86725	1.15308	.89830	1.11321	.93034	1.07487	.96344	1.03794	.99768	1.00233	4
57	.86776	1.15240	.89883	1.11256	.93088	1.07425	.96400	1.03734	.99826	1.00175	3
58	.86827	1.15172	.89935	1.11191	.93143	1.07362	.96457	1.03674	.99884	1.00116	2
59	.86878	1.15104	.89988	1.11126	.93197	1.07299	.96513	1.03613	.99942	1.00058	1
60	.86929	1.15037	.90040	1.11061	.93252	1.07237	.96569	1.03553	1.00000	1.00000	0
′	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	Cotang	Tang	′
	49°		48°		47°		46°		45°		

Table of Angles for Gashing Worm Wheels

TABLE OF ANGLES FOR GASHING WORM WHEELS.

LEAD.	.1000"	.1111"	.1250"	.1333"	.1429"	.1538"	.1666"	.1818"	.2000"	.2222"	.2500"	.2857"	.3333"	.3636"	.3750"	.4000"	.4285"	.4444"	.5000"	.5714"	.6000"	.6666"	.7500"	8000"	1.0000"	1.3333"	1.5000"	2.0000"	3.0000"
TURNS PER INCH	10	9	8	7½	7	6½	6	5½	5	4½	4	3½	3	2¾	2⅔	2½	2⅓	2¼	2	1¾	1⅔	1½	1⅓	1¼	1	¾	⅔	½	⅓
PITCH DIAMETERS 5/8"	2°-55'	3°-14'	3°-38'	3°-51'	4°-10'	4°-29'	4°-51'	5°-18'	5°-49'	6°-28'	7°-16'	8°-17'	9°-38'	10°-30'	10°-49'	11°-31'													
¾	2°-26'	2°-42'	3°-2'	3°-14'	3°-28'	3°-44'	4°-3'	4°-25'	4°-51'	5°-23'	6°-4'	6°-55'	8°-3'	8°-46'	9°-3'	9°-38'	10°-18'												
⅞	2°-5'	2°-19'	2°-36'	2°-47'	2°-58'	3°-12'	3°-28'	3°-47'	4°-10'	4°-37'	5°-12'	5°-56'	6°-55'	7°-32'	7°-46'	8°-17'	8°-52'												
1	1°-49'	2°-1'	2°-17'	2°-26'	2°-36'	2°-48'	3°-2'	3°-19'	3°-39'	4°-3'	4°-33'	5°-12'	6°-3'	6°-36'	6°-43'	7°-15'	7°-47'	8°-3'											
1⅛	1°-37'	1°-48'	2°-2'	2°-10'	2°-19'	2°-30'	2°-42'	2°-57'	3°-14'	3°-36'	4°-3'	4°-37'	5°-23'	5°-52'	6°-4'	6°-27'	6°-55'	7°-10'											
1¼	1°-28'	1°-37'	1°-49'	1°-57'	2°-5'	2°-15'	2°-26'	2°-39'	2°-55'	3°-14'	3°-39'	4°-10'	4°-51'	5°-17'	5°-27'	5°-49'	6°-14'	6°-27'	7°-15'										
1⅜	1°-20'	1°-28'	1°-39'	1°-46'	1°-54'	2°-2'	2°-13'	2°-25'	2°-39'	2°-57'	3°-19'	3°-47'	4°-25'	4°-49'	4°-58'	5°-17'	5°-40'	5°-52'	6°-36'										
1½	1°-13'	1°-21'	1°-31'	1°-37'	1°-44'	1°-52'	2°-1'	2°-13'	2°-26'	2°-42'	3°-2'	3°-28'	4°-3'	4°-25'	4°-33'	4°-51'	5°-12'	5°-23'	6°-3'	6°-55'									
1⅝	1°-7'	1°-15'	1°-24'	1°-30'	1°-36'	1°-44'	1°-52'	2°-2'	2°-15'	2°-30'	2°-48'	3°-12'	3°-44'	4°-4'	4°-12'	4°-29'	4°-48'	4°-59'	5°-36'	6°-23'	6°-42'								
1¾	1°-2'	1°-9'	1°-18'	1°-23'	1°-29'	1°-36'	1°-44'	1°-54'	2°-5'	2°-19'	2°-36'	2°-58'	3°-28'	3°-47'	3°-54'	4°-10'	4°-27'	4°-37'	5°-12'	5°-56'	6°-14'								
1⅞	58'	1°-5'	1°-13'	1°-18'	1°-23'	1°-30'	1°-37'	1°-46'	1°-57'	2°-10'	2°-26'	2°-47'	3°-14'	3°-32'	3°-39'	3°-53'	4°-10'	4°-19'	4°-51'	5°-32'	5°-49'	6°-27'							
2	55'	1°-1'	1°-8'	1°-13'	1°-18'	1°-24'	1°-31'	1°-39'	1°-49'	2°-2'	2°-17'	2°-36'	3°-2'	3°-19'	3°-25'	3°-39'	3°-54'	4°-3'	4°-33'	5°-12'	5°-27'	6°-3'							
2⅛	52'	57'	1°-4'	1°-9'	1°-14'	1°-19'	1°-26'	1°-34'	1°-43'	1°-54'	2°-9'	2°-27'	2°-52'	3°-7'	3°-13'	3°-26'	3°-40'	3°-46'	4°-17'	4°-54'	5°-8'	5°-42'	6°-25'						
2¼	49'	54	1°-1'	1°-5'	1°-9'	1°-15'	1°-21'	1°-28'	1°-37'	1°-48'	2°-2'	2°-19'	2°-42'	2°-57'	3°-2'	3°-14'	3°-28'	3°-36'	4°-3'	4°-37'	4°-51'	5°-23'	6°-3'						
2⅜	46'	51'	58'	1°-1'	1°-6'	1°-11'	1°-17'	1°-24'	1°-32'	1°-42'	1°-55'	2°-12'	2°-33'	2°-47'	2°-53'	3°-4'	3°-17'	3°-25'	3°-50'	4°-23'	4°-36'	5°-6'	5°-44'	6°-7'					
2½	44'	49'	54'	58'	1°-3'	1°-7'	1°-13'	1°-20'	1°-27'	1°-37'	1°-49'	2°-5'	2°-26'	2°-39'	2°-44'	2°-55'	3°-7'	3°-14'	3°-39'	4°-10'	4°-22'	4°-51'	5°-27'	5°-49'					

TABLE OF ANGLES FOR GASHING WORM WHEELS.—(*Continued.*)

LEAD.	.1000"	.1111"	.1250"	.1333"	.1429"	.1538"	.1666"	.1818"	.2000"	.2222"	.2500"	.2857"	.3333"	.3636"	.3750"	.4000"	.4285"	.4444"	.5000"	.5714"	.6000"	.6666"	.7500"	.8000"	1.0000"	1.3333"	1.5000"	2.0000"	3.0000"
TURNS PER INCH	10	9	8	7½	7	6½	6	5½	5	4½	4	3½	3	2¾	2⅔	2½	2⅓	2¼	2	1¾	1⅔	1½	1⅓	1¼	1	¾	⅔	½	⅓
PITCH DIAMETERS. 2⅝"	42'	46'	52'	56'	1°	1°-4'	1°-9'	1°-16'	1°-23'	1°-33'	1°-44'	1°-59'	2°-19'	2°-31'	2°-36'	2°-47'	2°-59'	3°-5'	3°-28'	3°-58'	4°-10'	4°-37'	5°-12'	5°-32'	6°-55'				
2¾	40'	44'	50'	53'	57'	1°-1'	1°-6'	1°-12'	1°-20'	1°-28'	1°-39'	1°-54'	2°-13'	2°-25'	2°-29'	2°-39'	2°-50'	2°-57'	3°-19'	3°-47'	3°-58'	4°-25'	4°-58'	5°-17'	6°-36'				
2⅞	38'	42'	48'	51'	54'	58'	1°-3'	1°-9'	1°-16'	1°-25'	1°-35'	1°-49'	2°-7'	2°-18'	2°-23'	2°-32'	2°-43'	2°-49'	3°-10'	3°-37'	3°-48'	4°-13'	4°-45'	5°-4'	6°-19'	8°-24'			
3	36'	40'	46'	49'	52'	56'	1°-1'	1°-6'	1°-13'	1°-21'	1°-31'	1°-44'	2°-2'	2°-13'	2°-17'	2°-26'	2°-36'	2°-42'	3°-2'	3°-28'	3°-39'	4°-3'	4°-33'	4°-51'	6°-3'	8°-3'	9°-3'		
3¼	34'	38'	42'	45'	48'	52'	56'	1°-1'	1°-7'	1°-15'	1°-24'	1°-36'	1°-52'	2°-2'	2°-6'	2°-14'	2°-24'	2°-30'	2°-48'	3°-12'	3°-22'	3°-44'	4°-12'	4°-29'	5°-36'	7°-26'	8°-22'		
3½	32'	35'	39'	42'	45'	48'	52'	57'	1°-3'	1°-9'	1°-18'	1°-29'	1°-44'	1°-54'	1°-57'	2°-5'	2°-14'	2°-19'	2°-36'	2°-59'	3°-7'	3°-28'	3°-54'	4°-10'	5°-12'	6°-54'	7°-46'	10°-19'	
3¾	30'	33'	36'	39'	42'	46'	48'	53'	58'	1°-5'	1°-13'	1°-23'	1°-37'	1°-46'	1°-49'	1°-57'	2°-5'	2°-10'	2°-26'	2°-47'	2°-55'	3°-14'	3°-39'	3°-53'	4°-51'	6°-27'	7°-15'	9°-38'	
4		31'	34'	37'	39'	42'	46'	50'	55'	1°-1'	1°-8'	1°-18'	1°-31'	1°-39'	1°-43'	1°-49'	1°-55'	2°-2'	2°-17'	2°-36'	2°-44'	3°-2'	3°-25'	3°-39'	4°-33'	6°-4'	6°-49'	9°-3'	13°-26'
4¼			32'	34'	37'	40'	43'	47'	52'	57'	1°-4'	1°-14'	1°-26'	1°-34'	1°-37'	1°-43'	1°-50'	1°-54'	2°-9'	2°-27'	2°-34'	2°-52'	3°-13'	3°-26'	4°-17'	5°-42'	6°-26'	8°-32'	12°-40'
4½				32'	35'	37'	40'	44'	49'	54'	1°-1'	1°-9'	1°-21'	1°-28'	1°-31'	1°-37'	1°-41'	1°-48'	2°-2'	2°-19'	2°-26'	2°-42'	3°-2'	3°-14'	4°-3'	5°-23'	6°-4'	8°-3'	11°-59'
4¾					33'	35'	38'	42'	46'	51'	58'	1°-6'	1°-17'	1°-24'	1°-26'	1°-32'	1°-37'	1°-42'	1°-55'	2°-12'	2°-18'	2°-33'	2°-53'	3°-4'	3°-50'	5°-6'	6°-44'	7°-38'	11°-22'
5						34'	36'	40'	44'	49'	55'	1°-3'	1°-13'	1°-20'	1°-22'	1°-28'	1°-34'	1°-37'	1°-49'	2°-5'	2°-11'	2°-26'	2°-44'	2°-55'	3°-39'	4°-51'	5°-27'	7°-15'	10°-49'
5¼							35'	38'	42'	46'	52'	1°-1'	1°-9'	1°-16'	1°-18'	1°-23'	1°-29'	1°-33'	1°-44'	1°-59'	2°-5'	2°-19'	2°-36'	2°-47'	3°-28'	4°-37'	5°-12'	6°-54'	10°-19'
5½								36'	40'	44'	50'	57'	1°-6'	1°-12'	1°-15'	1°-20'	1°-25'	1°-28'	1°-39'	1°-54'	1°-59'	2°-13'	2°-29'	2°-39'	3°-19'	4°-25'	4°-58'	6°-36'	9°-51'
5¾									38'	42'	48'	54'	1°-3'	1°-9'	1°-11'	1°-16'	1°-22'	1°-24'	1°-35'	1°-49'	1°-54'	2°-7'	2°-23'	2°-32'	3°-10'	4°-13'	4°-45'	6°-19'	9°-26'
6										40'	46'	52'	1°-1'	1°-6'	1°-8'	1°-13'	1°-18'	1°-21'	1°-31'	1°-44'	1°-49'	2°-1'	2°-17'	2°-26'	3°-2'	4°-2'	4°-33'	6°-3'	9°-2'

TABLES OF PRIME NUMBERS AND FACTORS.

In making use of these tables, the following explanation may be of assistance: the two columns at the left give the last two figures of the number to be factored; the first column gives all numbers to 50 and the second column from 50 to 100.

EXAMPLE 1.—Required, the factors of 138. Refer to the column of numbers from 100 to 150 and follow down the column until opposite 38 in the left-hand column; the factors are found to be $2 \times 3 \times 23$.

EXAMPLE 2.—Required, the factors for 1672. Refer to the column of numbers from 1650 to 1700 and follow down the column until opposite 72 in the second column at the left; the factors are found to be $2^3 \times 11 \times 19$ or, more conveniently stated for factoring, $2 \times 2 \times 2 \times 11 \times 19$.

PRIME NUMBERS AND FACTORS 1–10200.

From		0	50	100	150	200	250
To		50	100	150	200	250	300
0	50	....	$2\cdot5^2$	$2^2\cdot5^2$	$2\cdot3\cdot5^2$	$2^3\cdot5^2$	$2\cdot5^3$
1	51	....	$3\cdot17$	....	....	$3\cdot67$	....
2	52	....	$2^2\cdot13$	$2\cdot3\cdot17$	$2^3\cdot19$	$2\cdot101$	$2^2\cdot3^2\cdot7$
3	53	....	....	....	$3^2\cdot17$	$7\cdot29$	$11\cdot23$
4	54	2^2	$2\cdot3^3$	$2^3\cdot13$	$2\cdot7\cdot11$	$2^2\cdot3\cdot17$	$2\cdot127$
5	55	....	$5\cdot11$	$3\cdot5\cdot7$	$5\cdot31$	$5\cdot41$	$3\cdot5\cdot17$
6	56	$2\cdot3$	$2^3\cdot7$	$2\cdot53$	$2^2\cdot3\cdot13$	$2\cdot103$	2^8
7	57	....	$3\cdot19$	....	....	$3^2\cdot23$	....
8	58	2^3	$2\cdot29$	$2^2\cdot3^3$	$2\cdot79$	$2^4\cdot13$	$2\cdot3\cdot43$
9	59	3^2	....	....	$3\cdot53$	$11\cdot19$	$7\cdot37$
10	60	$2\cdot5$	$2^2\cdot3\cdot5$	$2\cdot5\cdot11$	$2^5\cdot5$	$2\cdot3\cdot5\cdot7$	$2^2\cdot5\cdot13$
11	61	....	....	$3\cdot37$	$7\cdot23$	....	$3^2\cdot29$
12	62	$2^2\cdot3$	$2\cdot31$	$2^4\cdot7$	$2\cdot3^4$	$2^2\cdot53$	$2\cdot131$
13	63	....	$3^2\cdot7$	....	....	$3\cdot71$	....
14	64	$2\cdot7$	2^6	$2\cdot3\cdot19$	$2^2\cdot41$	$2\cdot107$	$2^3\cdot3\cdot11$
15	65	$3\cdot5$	$5\cdot13$	$5\cdot23$	$3\cdot5\cdot11$	$5\cdot43$	$5\cdot53$
16	66	2^4	$2\cdot3\cdot11$	$2^2\cdot29$	$2\cdot83$	$2^3\cdot3^3$	$2\cdot7\cdot19$
17	67	....	....	$3^2\cdot13$	....	$7\cdot31$	$3\cdot89$
18	68	$2\cdot3^2$	$2^2\cdot17$	$2\cdot59$	$2^3\cdot3\cdot7$	$2\cdot109$	$2^2\cdot67$
19	69	....	$3\cdot23$	$7\cdot17$	13^2	$3\cdot73$	....
20	70	$2^2\cdot5$	$2\cdot5\cdot7$	$2^3\cdot3\cdot5$	$2\cdot5\cdot17$	$2^2\cdot5\cdot11$	$2\cdot3^3\cdot5$
21	71	$3\cdot7$	....	11^2	$3^2\cdot19$	$13\cdot17$	....
22	72	$2\cdot11$	$2^3\cdot3^2$	$2\cdot61$	$2^2\cdot43$	$2\cdot3\cdot37$	$2^4\cdot17$
23	73	....	....	$3\cdot41$	....	....	$3\cdot7\cdot13$
24	74	$2^3\cdot3$	$2\cdot37$	$2^2\cdot31$	$2\cdot3\cdot29$	$2^5\cdot7$	$2\cdot137$
25	75	5^2	$3\cdot5^2$	5^3	$5^2\cdot7$	$3^2\cdot5^2$	$5^2\cdot11$
26	76	$2\cdot13$	$2^2\cdot19$	$2\cdot3^2\cdot7$	$2^4\cdot11$	$2\cdot113$	$2^2\cdot3\cdot23$
27	77	3^3	$7\cdot11$	....	$3\cdot59$	....	....
28	78	$2^2\cdot7$	$2\cdot3\cdot13$	2^7	$2\cdot89$	$2^2\cdot3\cdot19$	$2\cdot139$
29	79	....	....	$3\cdot43$	....	....	$3^2\cdot31$
30	80	$2\cdot3\cdot5$	$2^4\cdot5$	$2\cdot5\cdot13$	$2^2\cdot3^2\cdot5$	$2\cdot5\cdot23$	$2^3\cdot5\cdot7$
31	81	....	3^4	....	....	$3\cdot7\cdot11$	....
32	82	2^5	$2\cdot41$	$2^2\cdot3\cdot11$	$2\cdot7\cdot13$	$2^3\cdot29$	$2\cdot3\cdot47$
33	83	$3\cdot11$	....	$7\cdot19$	$3\cdot61$	....	....
34	84	$2\cdot17$	$2^2\cdot3\cdot7$	$2\cdot67$	$2^3\cdot23$	$2\cdot3^2\cdot13$	$2^2\cdot71$
35	85	$5\cdot7$	$5\cdot17$	$3^3\cdot5$	$5\cdot37$	$5\cdot47$	$3\cdot5\cdot19$
36	86	$2^2\cdot3^2$	$2\cdot43$	$2^3\cdot17$	$2\cdot3\cdot31$	$2^2\cdot59$	$2\cdot11\cdot13$
37	87	....	$3\cdot29$	....	$11\cdot17$	$3\cdot79$	$7\cdot41$
38	88	$2\cdot19$	$2^3\cdot11$	$2\cdot3\cdot23$	$2^2\cdot47$	$2\cdot7\cdot17$	$2^5\cdot3^2$
39	89	$3\cdot13$	....	....	$3^3\cdot7$	....	17^2
40	90	$2^3\cdot5$	$2\cdot3^2\cdot5$	$2^2\cdot5\cdot7$	$2\cdot5\cdot19$	$2^4\cdot3\cdot5$	$2\cdot5\cdot29$
41	91	....	$7\cdot13$	$3\cdot47$	....	....	$3\cdot97$
42	92	$2\cdot3\cdot7$	$2^2\cdot23$	$2\cdot71$	$2^6\cdot3$	$2\cdot11^2$	$2^2\cdot73$
43	93	....	$3\cdot31$	$11\cdot13$	....	3^5	....
44	94	$2^2\cdot11$	$2\cdot47$	$2^4\cdot3^2$	$2\cdot97$	$2^2\cdot61$	$2\cdot3\cdot7^2$
45	95	$3^2\cdot5$	$5\cdot19$	$5\cdot29$	$3\cdot5\cdot13$	$5\cdot7^2$	$5\cdot59$
46	96	$2\cdot23$	$2^5\cdot3$	$2\cdot73$	$2^2\cdot7^2$	$2\cdot3\cdot41$	$2^3\cdot37$
47	97	....	....	$3\cdot7^2$	....	$13\cdot19$	$3^3\cdot11$
48	98	$2^4\cdot3$	$2\cdot7^2$	$2^2\cdot37$	$2\cdot3^2\cdot11$	$2^3\cdot31$	$2\cdot149$
49	99	7^2	$3^2\cdot11$	....	....	$3\cdot83$	$13\cdot23$
50	100	$2\cdot5^2$	$2^2\cdot5^2$	$2\cdot3\cdot5^2$	$2^3\cdot5^2$	$2\cdot5^3$	$2^2\cdot3\cdot5^2$

From		300	350	400	450	500	550
To		350	400	450	500	550	600
0	50	$2^2\cdot3\cdot5^2$	$2\cdot5^2\cdot7$	$2^4\cdot5^2$	$2\cdot3^2\cdot5^2$	$2^2\cdot5^3$	$2\cdot5^2\cdot11$
1	51	$7\cdot43$	$3^3\cdot13$	....	$11\cdot41$	$3\cdot167$	$19\cdot29$
2	52	$2\cdot151$	$2^5\cdot11$	$2\cdot3\cdot67$	$2^2\cdot113$	$2\cdot251$	$2^3\cdot3\cdot23$
3	53	$3\cdot101$	....	$13\cdot31$	$3\cdot151$	....	$7\cdot79$
4	54	$2^4\cdot19$	$2\cdot3\cdot59$	$2^2\cdot101$	$2\cdot227$	$2^3\cdot3^2\cdot7$	$2\cdot277$
5	55	$5\cdot61$	$5\cdot71$	$3^4\cdot5$	$5\cdot7\cdot13$	$5\cdot101$	$3\cdot5\cdot37$
6	56	$2\cdot3^2\cdot17$	$2^2\cdot89$	$2\cdot7\cdot29$	$2^3\cdot3\cdot19$	$2\cdot11\cdot23$	$2^2\cdot139$
7	57	....	$3\cdot7\cdot17$	$11\cdot37$	....	$3\cdot13^2$	....
8	58	$2^2\cdot7\cdot11$	$2\cdot179$	$2^3\cdot3\cdot17$	$2\cdot229$	$2^2\cdot127$	$2\cdot3^2\cdot31$
9	59	$3\cdot103$	....	....	$3^3\cdot17$	....	$13\cdot43$
10	60	$2\cdot5\cdot31$	$2^3\cdot3^2\cdot5$	$2\cdot5\cdot41$	$2^2\cdot5\cdot23$	$2\cdot3\cdot5\cdot17$	$2^4\cdot5\cdot7$
11	61	....	19^2	$3\cdot137$	....	$7\cdot73$	$3\cdot11\cdot17$
12	62	$2^3\cdot3\cdot13$	$2\cdot181$	$2^2\cdot103$	$2\cdot3\cdot7\cdot11$	2^9	$2\cdot281$
13	63	....	$3\cdot11^2$	$7\cdot59$	....	$3^3\cdot19$	....
14	64	$2\cdot157$	$2^2\cdot7\cdot13$	$2\cdot3^2\cdot23$	$2^4\cdot29$	$2\cdot257$	$2^2\cdot3\cdot47$
15	65	$3^2\cdot5\cdot7$	$5\cdot73$	$5\cdot83$	$3\cdot5\cdot31$	$5\cdot103$	$5\cdot113$
16	66	$2^2\cdot79$	$2\cdot3\cdot61$	$2^5\cdot13$	$2\cdot233$	$2^2\cdot3\cdot43$	$2\cdot283$
17	67	....	....	$3\cdot139$	....	$11\cdot47$	$3^4\cdot7$
18	68	$2\cdot3\cdot53$	$2^4\cdot23$	$2\cdot11\cdot19$	$2^2\cdot3^2\cdot13$	$2\cdot7\cdot37$	$2^3\cdot71$
19	69	$11\cdot29$	$3^2\cdot41$	....	$7\cdot67$	$3\cdot173$	....
20	70	$2^6\cdot5$	$2\cdot5\cdot37$	$2^2\cdot3\cdot5\cdot7$	$2\cdot5\cdot47$	$2^3\cdot5\cdot13$	$2\cdot3\cdot5\cdot19$
21	71	$3\cdot107$	$7\cdot53$	....	$3\cdot157$	....	....
22	72	$2\cdot7\cdot23$	$2^2\cdot3\cdot31$	$2\cdot211$	$2^3\cdot59$	$2\cdot3^2\cdot29$	$2^2\cdot11\cdot13$
23	73	$17\cdot19$	....	$3^2\cdot47$	$11\cdot43$	....	$3\cdot191$
24	74	$2^2\cdot3^4$	$2\cdot11\cdot17$	$2^3\cdot53$	$2\cdot3\cdot79$	$2^2\cdot131$	$2\cdot7\cdot41$
25	75	$5^2\cdot13$	$3\cdot5^3$	$5^2\cdot17$	$5^2\cdot19$	$3\cdot5^2\cdot7$	$5^2\cdot23$
26	76	$2\cdot163$	$2^3\cdot47$	$2\cdot3\cdot71$	$2^2\cdot7\cdot17$	$2\cdot263$	$2^6\cdot3^2$
27	77	$3\cdot109$	$13\cdot29$	$7\cdot61$	$3^2\cdot53$	$17\cdot31$	....
28	78	$2^3\cdot41$	$2\cdot3^3\cdot7$	$2^2\cdot107$	$2\cdot239$	$2^4\cdot3\cdot11$	$2\cdot17^2$
29	79	$7\cdot47$	....	$3\cdot11\cdot13$	....	23^2	$3\cdot193$
30	80	$2\cdot3\cdot5\cdot11$	$2^2\cdot5\cdot19$	$2\cdot5\cdot43$	$2^5\cdot3\cdot5$	$2\cdot5\cdot53$	$2^2\cdot5\cdot29$
31	81	....	$3\cdot127$	....	$13\cdot37$	$3^2\cdot59$	$7\cdot83$
32	82	$2^2\cdot83$	$2\cdot191$	$2^4\cdot3^3$	$2\cdot241$	$2^2\cdot7\cdot19$	$2\cdot3\cdot97$
33	83	$3^2\cdot37$	....	....	$3\cdot7\cdot23$	$13\cdot41$	$11\cdot53$
34	84	$2\cdot167$	$2^7\cdot3$	$2\cdot7\cdot31$	$2^2\cdot11^2$	$2\cdot3\cdot89$	$2^3\cdot73$
35	85	$5\cdot67$	$5\cdot7\cdot11$	$3\cdot5\cdot29$	$5\cdot97$	$5\cdot107$	$3^2\cdot5\cdot13$
36	86	$2^4\cdot3\cdot7$	$2\cdot193$	$2^2\cdot109$	$2\cdot3^5$	$2^3\cdot67$	$2\cdot293$
37	87	....	$3^2\cdot43$	$19\cdot23$	....	$3\cdot179$	....
38	88	$2\cdot13^2$	$2^2\cdot97$	$2\cdot3\cdot73$	$2^3\cdot61$	$2\cdot269$	$2^2\cdot3\cdot7^2$
39	89	$3\cdot113$	....	....	$3\cdot163$	$7^2\cdot11$	$19\cdot31$
40	90	$2^2\cdot5\cdot17$	$2\cdot3\cdot5\cdot13$	$2^3\cdot5\cdot11$	$2\cdot5\cdot7^2$	$2^2\cdot3^3\cdot5$	$2\cdot5\cdot59$
41	91	$11\cdot31$	$17\cdot23$	$3^2\cdot7^2$	....	....	$3\cdot197$
42	92	$2\cdot3^2\cdot19$	$2^3\cdot7^2$	$2\cdot13\cdot17$	$2^2\cdot3\cdot41$	$2\cdot271$	$2^4\cdot37$
43	93	7^3	$3\cdot131$	....	$17\cdot29$	$3\cdot181$	....
44	94	$2^3\cdot43$	$2\cdot197$	$2^2\cdot3\cdot37$	$2\cdot13\cdot19$	$2^5\cdot17$	$2\cdot3^3\cdot11$
45	95	$3\cdot5\cdot23$	$5\cdot79$	$5\cdot89$	$3^2\cdot5\cdot11$	$5\cdot109$	$5\cdot7\cdot17$
46	96	$2\cdot173$	$2^2\cdot3^2\cdot11$	$2\cdot223$	$2^4\cdot31$	$2\cdot3\cdot7\cdot13$	$2^2\cdot149$
47	97	....	....	$3\cdot149$	$7\cdot71$	....	$3\cdot199$
48	98	$2^2\cdot3\cdot29$	$2\cdot199$	$2^6\cdot7$	$2\cdot3\cdot83$	$2^2\cdot137$	$2\cdot13\cdot23$
49	99	....	$3\cdot7\cdot19$	....	....	$3^2\cdot61$	....
50	100	$2\cdot5^2\cdot7$	$2^4\cdot5^2$	$2\cdot3^2\cdot5^2$	$2^2\cdot5^3$	$2\cdot5^2\cdot11$	$2^3\cdot3\cdot5^2$

From		600	650	700	750	800	850
To		650	700	750	800	850	900
0	50	$2^3\cdot3\cdot5^2$	$2\cdot5^2\cdot13$	$2^2\cdot5^2\cdot7$	$2\cdot3\cdot5^3$	$2^5\cdot5^2$	$2\cdot5^2\cdot17$
1	51	....	$3\cdot7\cdot31$	....	....	$3^2\cdot89$	$23\cdot37$
2	52	$2\cdot7\cdot43$	$2^2\cdot163$	$2\cdot3^3\cdot13$	$2^4\cdot47$	$2\cdot401$	$2^2\cdot3\cdot71$
3	53	$3^2\cdot67$	....	$19\cdot37$	$3\cdot251$	$11\cdot73$	....
4	54	$2^2\cdot151$	$2\cdot3\cdot109$	$2^6\cdot11$	$2\cdot13\cdot29$	$2^2\cdot3\cdot67$	$2\cdot7\cdot61$
5	55	$5\cdot11^2$	$5\cdot131$	$3\cdot5\cdot47$	$5\cdot151$	$5\cdot7\cdot23$	$3^2\cdot5\cdot19$
6	56	$2\cdot3\cdot101$	$2^4\cdot41$	$2\cdot353$	$2^2\cdot3^3\cdot7$	$2\cdot13\cdot31$	$2^3\cdot107$
7	57	....	$3^2\cdot73$	$7\cdot101$	....	$3\cdot269$	....
8	58	$2^5\cdot19$	$2\cdot7\cdot47$	$2^2\cdot3\cdot59$	$2\cdot379$	$2^3\cdot101$	$2\cdot3\cdot11\cdot13$
9	59	$3\cdot7\cdot29$	....	....	$3\cdot11\cdot23$	....	....
10	60	$2\cdot5\cdot61$	$2^2\cdot3\cdot5\cdot11$	$2\cdot5\cdot71$	$2^3\cdot5\cdot19$	$2\cdot3^4\cdot5$	$2^2\cdot5\cdot43$
11	61	$13\cdot47$	....	$3^2\cdot79$	....	....	$3\cdot7\cdot41$
12	62	$2^2\cdot3^2\cdot17$	$2\cdot331$	$2^3\cdot89$	$2\cdot3\cdot127$	$2^2\cdot7\cdot29$	$2\cdot431$
13	63	....	$3\cdot13\cdot17$	$23\cdot31$	$7\cdot109$	$3\cdot271$	....
14	64	$2\cdot307$	$2^3\cdot83$	$2\cdot3\cdot7\cdot17$	$2^2\cdot191$	$2\cdot11\cdot37$	$2^5\cdot3^3$
15	65	$3\cdot5\cdot41$	$5\cdot7\cdot19$	$5\cdot11\cdot13$	$3^2\cdot5\cdot17$	$5\cdot163$	$5\cdot173$
16	66	$2^3\cdot7\cdot11$	$2\cdot3^2\cdot37$	$2^2\cdot179$	$2\cdot383$	$2^4\cdot3\cdot17$	$2\cdot433$
17	67	....	$23\cdot29$	$3\cdot239$	$13\cdot59$	$19\cdot43$	$3\cdot17^2$
18	68	$2\cdot3\cdot103$	$2^2\cdot167$	$2\cdot359$	$2^8\cdot3$	$2\cdot409$	$2^2\cdot7\cdot31$
19	69	....	$3\cdot223$	....	....	$3^2\cdot7\cdot13$	$11\cdot79$
20	70	$2^2\cdot5\cdot31$	$2\cdot5\cdot67$	$2^4\cdot3^2\cdot5$	$2\cdot5\cdot7\cdot11$	$2^2\cdot5\cdot41$	$2\cdot3\cdot5\cdot29$
21	71	$3^3\cdot23$	$11\cdot61$	$7\cdot103$	$3\cdot257$	....	$13\cdot67$
22	72	$2\cdot311$	$2^5\cdot3\cdot7$	$2\cdot19^2$	$2^2\cdot193$	$2\cdot3\cdot137$	$2^3\cdot109$
23	73	$7\cdot89$	....	$3\cdot241$	....	....	$3^2\cdot97$
24	74	$2^4\cdot3\cdot13$	$2\cdot337$	$2^2\cdot181$	$2\cdot3^2\cdot43$	$2^3\cdot103$	$2\cdot19\cdot23$
25	75	5^4	$3^3\cdot5^2$	$5^2\cdot29$	$5^2\cdot31$	$3\cdot5^2\cdot11$	$5^3\cdot7$
26	76	$2\cdot313$	$2^2\cdot13^2$	$2\cdot3\cdot11^2$	$2^3\cdot97$	$2\cdot7\cdot59$	$2^2\cdot3\cdot73$
27	77	$3\cdot11\cdot19$	....	....	$3\cdot7\cdot37$	....	....
28	78	$2^2\cdot157$	$2\cdot3\cdot113$	$2^3\cdot7\cdot13$	$2\cdot389$	$2^2\cdot3^2\cdot23$	$2\cdot439$
29	79	$17\cdot37$	$7\cdot97$	3^6	$19\cdot41$	....	$3\cdot293$
30	80	$2\cdot3^2\cdot5\cdot7$	$2^3\cdot5\cdot17$	$2\cdot5\cdot73$	$2^2\cdot3\cdot5\cdot13$	$2\cdot5\cdot83$	$2^4\cdot5\cdot11$
31	81	....	$3\cdot227$	$17\cdot43$	$11\cdot71$	$3\cdot277$	....
32	82	$2^3\cdot79$	$2\cdot11\cdot31$	$2^2\cdot3\cdot61$	$2\cdot17\cdot23$	$2^6\cdot13$	$2\cdot3^2\cdot7^2$
33	83	$3\cdot211$	....	....	$3^3\cdot29$	$7^2\cdot17$	....
34	84	$2\cdot317$	$2^2\cdot3^2\cdot19$	$2\cdot367$	$2^4\cdot7^2$	$2\cdot3\cdot139$	$2^2\cdot13\cdot17$
35	85	$5\cdot127$	$5\cdot137$	$3\cdot5\cdot7^2$	$5\cdot157$	$5\cdot167$	$3\cdot5\cdot59$
36	86	$2^2\cdot3\cdot53$	$2\cdot7^3$	$2^5\cdot23$	$2\cdot3\cdot131$	$2^2\cdot11\cdot19$	$2\cdot443$
37	87	$7^2\cdot13$	$3\cdot229$	$11\cdot67$	....	$3^3\cdot31$	....
38	88	$2\cdot11\cdot29$	$2^4\cdot43$	$2\cdot3^2\cdot41$	$2^2\cdot197$	$2\cdot419$	$2^3\cdot3\cdot37$
39	89	$3^2\cdot71$	$13\cdot53$	....	$3\cdot263$	....	$7\cdot127$
40	90	$2^7\cdot5$	$2\cdot3\cdot5\cdot23$	$2^2\cdot5\cdot37$	$2\cdot5\cdot79$	$2^3\cdot3\cdot5\cdot7$	$2\cdot5\cdot89$
41	91	....	....	$3\cdot13\cdot19$	$7\cdot113$	29^2	$3^4\cdot11$
42	92	$2\cdot3\cdot107$	$2^2\cdot173$	$2\cdot7\cdot53$	$2^3\cdot3^2\cdot11$	$2\cdot421$	$2^2\cdot223$
43	93	....	$3^2\cdot7\cdot11$	....	$13\cdot61$	$3\cdot281$	$19\cdot47$
44	94	$2^2\cdot7\cdot23$	$2\cdot347$	$2^3\cdot3\cdot31$	$2\cdot397$	$2^2\cdot211$	$2\cdot3\cdot149$
45	95	$3\cdot5\cdot43$	$5\cdot139$	$5\cdot149$	$3\cdot5\cdot53$	$5\cdot13^2$	$5\cdot179$
46	96	$2\cdot17\cdot19$	$2^3\cdot3\cdot29$	$2\cdot373$	$2^2\cdot199$	$2\cdot3^2\cdot47$	$2^7\cdot7$
47	97	....	$17\cdot41$	$3^2\cdot83$	....	$7\cdot11^2$	$3\cdot13\cdot23$
48	98	$2^3\cdot3^4$	$2\cdot349$	$2^2\cdot11\cdot17$	$2\cdot3\cdot7\cdot19$	$2^4\cdot53$	$2\cdot449$
49	99	$11\cdot59$	$3\cdot233$	$7\cdot107$	$17\cdot47$	$3\cdot283$	$29\cdot31$
50	100	$2\cdot5^2\cdot13$	$2^2\cdot5^2\cdot7$	$2\cdot3\cdot5^3$	$2^5\cdot5^2$	$2\cdot5^2\cdot17$	$2^2\cdot3^2\cdot5^2$

From		900	950	1000	1050	1100	1150
To		950	1000	1050	1100	1150	1200
0	50	$2^2\cdot3^2\cdot5^2$	$2\cdot5^2\cdot19$	$2^3\cdot5^3$	$2\cdot3\cdot5^2\cdot7$	$2^2\cdot5^2\cdot11$	$2\cdot5^2\cdot23$
1	51	$17\cdot53$	$3\cdot317$	$7\cdot11\cdot13$	....	$3\cdot367$	....
2	52	$2\cdot11\cdot41$	$2^3\cdot7\cdot17$	$2\cdot3\cdot167$	$2^2\cdot263$	$2\cdot19\cdot29$	$2^7\cdot3^2$
3	53	$3\cdot7\cdot43$	....	$17\cdot59$	$3^4\cdot13$	....	....
4	54	$2^3\cdot113$	$2\cdot3^2\cdot53$	$2^2\cdot251$	$2\cdot17\cdot31$	$2^4\cdot3\cdot23$	$2\cdot577$
5	55	$5\cdot181$	$5\cdot191$	$3\cdot5\cdot67$	$5\cdot211$	$5\cdot13\cdot17$	$3\cdot5\cdot7\cdot11$
6	56	$2\cdot3\cdot151$	$2^2\cdot239$	$2\cdot503$	$2^5\cdot3\cdot11$	$2\cdot7\cdot79$	$2^2\cdot17^2$
7	57	....	$3\cdot11\cdot29$	$19\cdot53$	$7\cdot151$	$3^3\cdot41$	$13\cdot89$
8	58	$2^2\cdot227$	$2\cdot479$	$2^4\cdot3^2\cdot7$	$2\cdot23^2$	$2^2\cdot277$	$2\cdot3\cdot193$
9	59	$3^2\cdot101$	$7\cdot137$	....	$3\cdot353$	....	$19\cdot61$
10	60	$2\cdot5\cdot7\cdot13$	$2^6\cdot3\cdot5$	$2\cdot5\cdot101$	$2^2\cdot5\cdot53$	$2\cdot3\cdot5\cdot37$	$2^3\cdot5\cdot29$
11	61	....	31^2	$3\cdot337$	....	$11\cdot101$	$3^3\cdot43$
12	62	$2^4\cdot3\cdot19$	$2\cdot13\cdot37$	$2^2\cdot11\cdot23$	$2\cdot3^2\cdot59$	$2^3\cdot139$	$2\cdot7\cdot83$
13	63	$11\cdot83$	$3^2\cdot107$	....	....	$3\cdot7\cdot53$	....
14	64	$2\cdot457$	$2^2\cdot241$	$2\cdot3\cdot13^2$	$2^3\cdot7\cdot19$	$2\cdot557$	$2^2\cdot3\cdot97$
15	65	$3\cdot5\cdot61$	$5\cdot193$	$5\cdot7\cdot29$	$3\cdot5\cdot71$	$5\cdot223$	$5\cdot233$
16	66	$2^2\cdot229$	$2\cdot3\cdot7\cdot23$	$2^3\cdot127$	$2\cdot13\cdot41$	$2^2\cdot3^2\cdot31$	$2\cdot11\cdot53$
17	67	$7\cdot131$	....	$3^2\cdot113$	$11\cdot97$	....	$3\cdot389$
18	68	$2\cdot3^3\cdot17$	$2^3\cdot11^2$	$2\cdot509$	$2^2\cdot3\cdot89$	$2\cdot13\cdot43$	$2^4\cdot73$
19	69	....	$3\cdot17\cdot19$	....	....	$3\cdot373$	$7\cdot167$
20	70	$2^3\cdot5\cdot23$	$2\cdot5\cdot97$	$2^2\cdot3\cdot5\cdot17$	$2\cdot5\cdot107$	$2^5\cdot5\cdot7$	$2\cdot3^2\cdot5\cdot13$
21	71	$3\cdot307$	....	....	$3^2\cdot7\cdot17$	$19\cdot59$	....
22	72	$2\cdot461$	$2^2\cdot3^5$	$2\cdot7\cdot73$	$2^4\cdot67$	$2\cdot3\cdot11\cdot17$	$2^2\cdot293$
23	73	$13\cdot71$	$7\cdot139$	$3\cdot11\cdot31$	$29\cdot37$	....	$3\cdot17\cdot23$
24	74	$2^2\cdot3\cdot7\cdot11$	$2\cdot487$	2^{10}	$2\cdot3\cdot179$	$2^2\cdot281$	$2\cdot587$
25	75	$5^2\cdot37$	$3\cdot5^2\cdot13$	$5^2\cdot41$	$5^2\cdot43$	$3^2\cdot5^3$	$5^2\cdot47$
26	76	$2\cdot463$	$2^4\cdot61$	$2\cdot3^3\cdot19$	$2^2\cdot269$	$2\cdot563$	$2^3\cdot3\cdot7^2$
27	77	$3^2\cdot103$	....	$13\cdot79$	$3\cdot359$	$7^2\cdot23$	$11\cdot107$
28	78	$2^5\cdot29$	$2\cdot3\cdot163$	$2^2\cdot257$	$2\cdot7^2\cdot11$	$2^3\cdot3\cdot47$	$2\cdot19\cdot31$
29	79	....	$11\cdot89$	$3\cdot7^3$	$13\cdot83$	....	$3^2\cdot131$
30	80	$2\cdot3\cdot5\cdot31$	$2^2\cdot5\cdot7^2$	$2\cdot5\cdot103$	$2^3\cdot3^3\cdot5$	$2\cdot5\cdot113$	$2^2\cdot5\cdot59$
31	81	$7^2\cdot19$	$3^2\cdot109$	....	$23\cdot47$	$3\cdot13\cdot29$	....
32	82	$2^2\cdot233$	$2\cdot491$	$2^3\cdot3\cdot43$	$2\cdot541$	$2^2\cdot283$	$2\cdot3\cdot197$
33	83	$3\cdot311$	....	....	$3\cdot19^2$	$11\cdot103$	$7\cdot13^2$
34	84	$2\cdot467$	$2^3\cdot3\cdot41$	$2\cdot11\cdot47$	$2^2\cdot271$	$2\cdot3^4\cdot7$	$2^5\cdot37$
35	85	$5\cdot11\cdot17$	$5\cdot197$	$3^2\cdot5\cdot23$	$5\cdot7\cdot31$	$5\cdot227$	$3\cdot5\cdot79$
36	86	$2^3\cdot3^2\cdot13$	$2\cdot17\cdot29$	$2^2\cdot7\cdot37$	$2\cdot3\cdot181$	$2^4\cdot71$	$2\cdot593$
37	87	....	$3\cdot7\cdot47$	$17\cdot61$	....	$3\cdot379$	....
38	88	$2\cdot7\cdot67$	$2^2\cdot13\cdot19$	$2\cdot3\cdot173$	$2^6\cdot17$	$2\cdot569$	$2^2\cdot3^3\cdot11$
39	89	$3\cdot313$	$23\cdot43$	....	$3^2\cdot11^2$	$17\cdot67$	$29\cdot41$
40	90	$2^2\cdot5\cdot47$	$2\cdot3^2\cdot5\cdot11$	$2^4\cdot5\cdot13$	$2\cdot5\cdot109$	$2^2\cdot3\cdot5\cdot19$	$2\cdot5\cdot7\cdot17$
41	91	....	....	$3\cdot347$	....	$7\cdot163$	$3\cdot397$
42	92	$2\cdot3\cdot157$	$2^5\cdot31$	$2\cdot521$	$2^2\cdot3\cdot7\cdot13$	$2\cdot571$	$2^3\cdot149$
43	93	$23\cdot41$	$3\cdot331$	$7\cdot149$	....	$3^2\cdot127$	....
44	94	$2^4\cdot59$	$2\cdot7\cdot71$	$2^2\cdot3^2\cdot29$	$2\cdot547$	$2^3\cdot11\cdot13$	$2\cdot3\cdot199$
45	95	$3^3\cdot5\cdot7$	$5\cdot199$	$5\cdot11\cdot19$	$3\cdot5\cdot73$	$5\cdot229$	$5\cdot239$
46	96	$2\cdot11\cdot43$	$2^2\cdot3\cdot83$	$2\cdot523$	$2^3\cdot137$	$2\cdot3\cdot191$	$2^2\cdot13\cdot23$
47	97	....	....	$3\cdot349$	....	$31\cdot37$	$3^2\cdot7\cdot19$
48	98	$2^2\cdot3\cdot79$	$2\cdot499$	$2^3\cdot131$	$2\cdot3^2\cdot61$	$2^2\cdot7\cdot41$	$2\cdot599$
49	99	$13\cdot73$	$3^3\cdot37$	....	$7\cdot157$	$3\cdot383$	$11\cdot109$
50	100	$2\cdot5^2\cdot19$	$2^3\cdot5^3$	$2\cdot3\cdot5^2\cdot7$	$2^2\cdot5^2\cdot11$	$2\cdot5^2\cdot23$	$2^4\cdot3\cdot5^2$

From	To	1200 1250	1250 1300	1300 1350	1350 1400	1400 1450	1450 1500
0	50	$2^4\cdot3\cdot5^2$	$2\cdot5^4$	$2^2\cdot5^2\cdot13$	$2\cdot3^3\cdot5^2$	$2^3\cdot5^2\cdot7$	$2\cdot5^2\cdot29$
1	51	....	$3^2\cdot139$	....	7·193	3·467	....
2	52	2·601	$2^2\cdot313$	2·3·7·31	$2^3\cdot13^2$	2·701	$2^2\cdot3\cdot11^2$
3	53	3·401	7·179	....	3·11·41	23·61	....
4	54	$2^2\cdot7\cdot43$	2·3·11·19	$2^3\cdot163$	2·677	$2^2\cdot3^3\cdot13$	2·727
5	55	5·241	5·251	$3^2\cdot5\cdot29$	5·271	5·281	3·5·97
6	56	$2\cdot3^2\cdot67$	$2^3\cdot157$	2·653	$2^2\cdot3\cdot113$	2·19·37	$2^4\cdot7\cdot13$
7	57	17·71	3·419	....	23·59	3·7·67	31·47
8	58	$2^3\cdot151$	2·17·37	$2^2\cdot3\cdot109$	2·7·97	$2^7\cdot11$	$2\cdot3^6$
9	59	3·13·31	....	7·11·17	$3^2\cdot151$	....	....
10	60	$2\cdot5\cdot11^2$	$2^2\cdot3^2\cdot5\cdot7$	2·5·131	$2^4\cdot5\cdot17$	2·3·5·47	$2^2\cdot5\cdot73$
11	61	7·173	13·97	3·19·23	....	17·83	3·487
12	62	$2^2\cdot3\cdot101$	2·631	$2^5\cdot41$	2·3·227	$2^2\cdot353$	2·17·43
13	63	....	3·421	13·101	29·47	$3^2\cdot157$	7·11·19
14	64	2·607	$2^4\cdot79$	$2\cdot3^2\cdot73$	$2^2\cdot11\cdot31$	2·7·101	$2^3\cdot3\cdot61$
15	65	$3^5\cdot5$	5·11·23	5·263	3·5·7·13	5·283	5·293
16	66	$2^6\cdot19$	2·3·211	$2^2\cdot7\cdot47$	2·683	$2^3\cdot3\cdot59$	2·733
17	67	....	7·181	3·439	....	13·109	$3^2\cdot163$
18	68	2·3·7·29	$2^2\cdot317$	2·659	$2^3\cdot3^2\cdot19$	2·709	$2^2\cdot367$
19	69	23·53	$3^3\cdot47$	....	37^2	3·11·43	13·113
20	70	$2^2\cdot5\cdot61$	2·5·127	$2^3\cdot3\cdot5\cdot11$	2·5·137	$2^2\cdot5\cdot71$	$2\cdot3\cdot5\cdot7^2$
21	71	3·11·37	31·41	....	3·457	$7^2\cdot29$	....
22	72	2·13·47	$2^3\cdot3\cdot53$	2·661	$2^2\cdot7^3$	$2\cdot3^2\cdot79$	$2^6\cdot23$
23	73	....	19·67	$3^3\cdot7^2$	....	....	3·491
24	74	$2^3\cdot3^2\cdot17$	$2\cdot7^2\cdot13$	$2^2\cdot331$	2·3·229	$2^4\cdot89$	2·11·67
25	75	$5^2\cdot7^2$	$3\cdot5^2\cdot17$	$5^2\cdot53$	$5^3\cdot11$	$3\cdot5^2\cdot19$	$5^2\cdot59$
26	76	2·613	$2^2\cdot11\cdot29$	2·3·13·17	$2^5\cdot43$	2·23·31	$2^2\cdot3^2\cdot41$
27	77	3·409	....	....	$3^4\cdot17$	....	7·211
28	78	$2^2\cdot307$	$2\cdot3^2\cdot71$	$2^4\cdot83$	2·13·53	$2^2\cdot3\cdot7\cdot17$	2·739
29	79	....	....	3·443	7·197	....	3·17·29
30	80	2·3·5·41	$2^8\cdot5$	2·5·7·19	$2^2\cdot3\cdot5\cdot23$	2·5·11·13	$2^3\cdot5\cdot37$
31	81	....	3·7·61	11^3	....	$3^3\cdot53$	....
32	82	$2^4\cdot7\cdot11$	2·641	$2^2\cdot3^2\cdot37$	2·691	$2^3\cdot179$	2·3·13·19
33	83	$3^2\cdot137$	....	31·43	3·461	....	....
34	84	2·617	$2^2\cdot3\cdot107$	2·23·29	$2^3\cdot173$	2·3·239	$2^2\cdot7\cdot53$
35	85	5·13·19	5·257	3·5·89	5·277	5·7·41	$3^3\cdot5\cdot11$
36	86	$2^2\cdot3\cdot103$	2·643	$2^3\cdot167$	$2\cdot3^2\cdot7\cdot11$	$2^2\cdot359$	2·743
37	87	....	$3^2\cdot11\cdot13$	7·191	19·73	3·479	....
38	88	2·619	$2^3\cdot7\cdot23$	2·3·223	$2^2\cdot347$	2·719	$2^4\cdot3\cdot31$
39	89	3·7·59	....	13·103	3·463	....	....
40	90	$2^3\cdot5\cdot31$	2·3·5·43	$2^2\cdot5\cdot67$	2·5·139	$2^5\cdot3^2\cdot5$	2·5·149
41	91	17·73	....	$3^2\cdot149$	13·107	11·131	3·7·71
42	92	$2\cdot3^3\cdot23$	$2^2\cdot17\cdot19$	2·11·61	$2^4\cdot3\cdot29$	2·7·103	$2^2\cdot373$
43	93	11·113	3·431	17·79	7·199	3·13·37	....
44	94	$2^2\cdot311$	2·647	$2^6\cdot3\cdot7$	2·17·41	$2^2\cdot19^2$	$2\cdot3^2\cdot83$
45	95	3·5·83	5·7·37	5·269	$3^2\cdot5\cdot31$	$5\cdot17^2$	5·13·23
46	96	2·7·89	$2^4\cdot3^4$	2·673	$2^2\cdot349$	2·3·241	$2^3\cdot11\cdot17$
47	97	29·43	....	3·449	11·127	....	3·499
48	98	$2^5\cdot3\cdot13$	2·11·59	$2^2\cdot337$	2·3·233	$2^3\cdot181$	2·7·107
49	99	....	3·433	19·71	....	$3^2\cdot7\cdot23$	....
50	100	$2\cdot5^4$	$2^2\cdot5^2\cdot13$	$2\cdot3^3\cdot5^2$	$2^3\cdot5^2\cdot7$	$2\cdot5^2\cdot29$	$2^2\cdot3\cdot5^3$

From	To	1500–1550	1550–1600	1600–1650	1650–1700	1700–1750	1750–1800
0	50	$2^2\cdot3\cdot5^3$	$2\cdot5^2\cdot31$	$2^6\cdot5^2$	$2\cdot3\cdot5^2\cdot11$	$2^2\cdot5^2\cdot17$	$2\cdot5^3\cdot7$
1	51	19·79	3·11·47	....	13·127	$3^5\cdot7$	17·103
2	52	2·751	$2^4\cdot97$	$2\cdot3^2\cdot89$	$2^2\cdot7\cdot59$	2·23·37	$2^3\cdot3\cdot73$
3	53	$3^2\cdot167$	....	7·229	3·19·29	13·131	....
4	54	$2^5\cdot47$	2·3·7·37	$2^2\cdot401$	2·827	$2^3\cdot3\cdot71$	2·877
5	55	5·7·43	5·311	3·5·107	5·331	5·11·31	$3^3\cdot5\cdot13$
6	56	2·3·251	$2^2\cdot389$	2·11·73	$2^3\cdot3^2\cdot23$	2·853	$2^2\cdot439$
7	57	11·137	$3^2\cdot173$	....	....	3·569	7·251
8	58	$2^2\cdot13\cdot29$	2·19·41	$2^3\cdot3\cdot67$	2·829	$2^2\cdot7\cdot61$	2·3·293
9	59	3·503	....	....	3·7·79	....	....
10	60	2·5·151	$2^3\cdot3\cdot5\cdot13$	2·5·7·23	$2^2\cdot5\cdot83$	$2\cdot3^2\cdot5\cdot19$	$2^5\cdot5\cdot11$
11	61	....	7·223	$3^2\cdot179$	11·151	29·59	3·587
12	62	$2^3\cdot3^3\cdot7$	2·11·71	$2^2\cdot13\cdot31$	2·3·277	$2^4\cdot107$	2·881
13	63	17·89	3·521	....	....	3·571	41·43
14	64	2·757	$2^2\cdot17\cdot23$	2·3·269	$2^7\cdot13$	2·857	$2^2\cdot3^2\cdot7^2$
15	65	3·5·101	5·313	5·17·19	$3^2\cdot5\cdot37$	$5\cdot7^3$	5·353
16	66	$2^2\cdot379$	$2\cdot3^3\cdot29$	$2^4\cdot101$	$2\cdot7^2\cdot17$	$2^2\cdot3\cdot11\cdot13$	2·883
17	67	37·41	....	$3\cdot7^2\cdot11$	....	17·101	3·19·31
18	68	2·3·11·23	$2^5\cdot7^2$	2·809	$2^2\cdot3\cdot139$	2·859	$2^3\cdot13\cdot17$
19	69	$7^2\cdot31$	3·523	....	....	$3^2\cdot191$	29·61
20	70	$2^4\cdot5\cdot19$	2·5·157	$2^2\cdot3^4\cdot5$	2·5·167	$2^3\cdot5\cdot43$	2·3·5·59
21	71	$3^2\cdot13^2$	....	....	3·557	....	7·11·23
22	72	2·761	$2^2\cdot3\cdot131$	2·811	$2^3\cdot11\cdot19$	2·3·7·41	$2^2\cdot443$
23	73	....	$11^2\cdot13$	3·541	7·239	....	$3^2\cdot197$
24	74	$2^2\cdot3\cdot127$	2·787	$2^3\cdot7\cdot29$	$2\cdot3^3\cdot31$	$2^2\cdot431$	2·887
25	75	$5^2\cdot61$	$3^2\cdot5^2\cdot7$	$5^3\cdot13$	$5^2\cdot67$	$3\cdot5^2\cdot23$	$5^2\cdot71$
26	76	2·7·109	$2^3\cdot197$	2·3·271	$2^2\cdot419$	2·863	$2^4\cdot3\cdot37$
27	77	3·509	19·83	....	3·13·43	11·157	....
28	78	$2^3\cdot191$	2·3·263	$2^2\cdot11\cdot37$	2·839	$2^6\cdot3^3$	2·7·127
29	79	11·139	....	$3^2\cdot181$	23·73	7·13·19	3·593
30	80	$2\cdot3^2\cdot5\cdot17$	$2^2\cdot5\cdot79$	2·5·163	$2^4\cdot3\cdot5\cdot7$	2·5·173	$2^2\cdot5\cdot89$
31	81	....	3·17·31	7·233	41^2	3·577	13·137
32	82	$2^2\cdot383$	2·7·113	$2^5\cdot3\cdot17$	$2\cdot29^2$	$2^2\cdot433$	$2\cdot3^4\cdot11$
33	83	3·7·73	....	23·71	$3^2\cdot11\cdot17$	....	....
34	84	2·13·59	$2^4\cdot3^2\cdot11$	2·19·43	$2^2\cdot421$	$2\cdot3\cdot17^2$	$2^3\cdot223$
35	85	5·307	5·317	3·5·109	5·337	5·347	3·5·7·17
36	86	$2^9\cdot3$	2·13·61	$2^2\cdot409$	2·3·281	$2^3\cdot7\cdot31$	2·19·47
37	87	29·53	$3\cdot23^2$	....	7·241	$3^2\cdot193$	....
38	88	2·769	$2^2\cdot397$	$2\cdot3^2\cdot7\cdot13$	$2^3\cdot211$	2·11·79	$2^2\cdot3\cdot149$
39	89	$3^4\cdot19$	7·227	11·149	3·563	37·47	....
40	90	$2^2\cdot5\cdot7\cdot11$	2·3·5·53	$2^3\cdot5\cdot41$	$2\cdot5\cdot13^2$	$2^2\cdot3\cdot5\cdot29$	2·5·179
41	91	23·67	37·43	3·547	19·89	....	$3^2\cdot199$
42	92	2·3·257	$2^3\cdot199$	2·821	$2^2\cdot3^2\cdot47$	2·13·67	$2^8\cdot7$
43	93	....	$3^3\cdot59$	31·53	....	3·7·83	11·163
44	94	$2^3\cdot193$	2·797	$2^2\cdot3\cdot137$	$2\cdot7\cdot11^2$	$2^4\cdot109$	2·3·13·23
45	95	3·5·103	5·11·29	5·7·47	3·5·113	5·349	5·359
46	96	2·773	$2^2\cdot3\cdot7\cdot19$	2·823	$2^5\cdot53$	$2\cdot3^2\cdot97$	$2^2\cdot449$
47	97	7·13·17	....	$3^3\cdot61$	....	....	3·599
48	98	$2^2\cdot3^2\cdot43$	2·17·47	$2^4\cdot103$	2·3·283	$2^2\cdot19\cdot23$	2·29·31
49	99	....	3·13·41	17·97	....	3·11·53	7·257
50	100	$2\cdot5^2\cdot31$	$2^6\cdot5^2$	$2\cdot3\cdot5^2\cdot11$	$2^2\cdot5^2\cdot17$	$2\cdot5^3\cdot7$	$2^3\cdot3^2\cdot5^2$

From		1800	1850	1900	1950	2000	2050
To		1850	1900	1950	2000	2050	2100
0	50	$2^3\cdot3^2\cdot5^2$	$2\cdot5^2\cdot37$	$2^2\cdot5^2\cdot19$	$2\cdot3\cdot5^2\cdot13$	$2^4\cdot5^3$	$2\cdot5^2\cdot41$
1	51	....	$3\cdot617$	....	....	$3\cdot23\cdot29$	$7\cdot293$
2	52	$2\cdot17\cdot53$	$2^2\cdot463$	$2\cdot3\cdot317$	$2^5\cdot61$	$2\cdot7\cdot11\cdot13$	$2^2\cdot3^3\cdot19$
3	53	$3\cdot601$	$17\cdot109$	$11\cdot173$	$3^2\cdot7\cdot31$	....	....
4	54	$2^2\cdot11\cdot41$	$2\cdot3^2\cdot103$	$2^4\cdot7\cdot17$	$2\cdot977$	$2^2\cdot3\cdot167$	$2\cdot13\cdot79$
5	55	$5\cdot19^2$	$5\cdot7\cdot53$	$3\cdot5\cdot127$	$5\cdot17\cdot23$	$5\cdot401$	$3\cdot5\cdot137$
6	56	$2\cdot3\cdot7\cdot43$	$2^6\cdot29$	$2\cdot953$	$2^2\cdot3\cdot163$	$2\cdot17\cdot59$	$2^3\cdot257$
7	57	$13\cdot139$	$3\cdot619$	....	$19\cdot103$	$3^2\cdot223$	$11^2\cdot17$
8	58	$2^4\cdot113$	$2\cdot929$	$2^2\cdot3^2\cdot53$	$2\cdot11\cdot89$	$2^3\cdot251$	$2\cdot3\cdot7^3$
9	59	$3^3\cdot67$	$11\cdot13^2$	$23\cdot83$	$3\cdot653$	$7^2\cdot41$	$29\cdot71$
10	60	$2\cdot5\cdot181$	$2^2\cdot3\cdot5\cdot31$	$2\cdot5\cdot191$	$2^3\cdot5\cdot7^2$	$2\cdot3\cdot5\cdot67$	$2^2\cdot5\cdot103$
11	61	....	....	$3\cdot7^2\cdot13$	$37\cdot53$	....	$3^2\cdot229$
12	62	$2^2\cdot3\cdot151$	$2\cdot7^2\cdot19$	$2^3\cdot239$	$2\cdot3^2\cdot109$	$2^2\cdot503$	$2\cdot1031$
13	63	$7^2\cdot37$	$3^4\cdot23$	....	$13\cdot151$	$3\cdot11\cdot61$	....
14	64	$2\cdot907$	$2^3\cdot233$	$2\cdot3\cdot11\cdot29$	$2^2\cdot491$	$2\cdot19\cdot53$	$2^4\cdot3\cdot43$
15	65	$3\cdot5\cdot11^2$	$5\cdot373$	$5\cdot383$	$3\cdot5\cdot131$	$5\cdot13\cdot31$	$5\cdot7\cdot59$
16	66	$2^3\cdot227$	$2\cdot3\cdot311$	$2^2\cdot479$	$2\cdot983$	$2^5\cdot3^2\cdot7$	$2\cdot1033$
17	67	$23\cdot79$	....	$3^3\cdot71$	$7\cdot281$	....	$3\cdot13\cdot53$
18	68	$2\cdot3^2\cdot101$	$2^2\cdot467$	$2\cdot7\cdot137$	$2^4\cdot3\cdot41$	$2\cdot1009$	$2^2\cdot11\cdot47$
19	69	$17\cdot107$	$3\cdot7\cdot89$	$19\cdot101$	$11\cdot179$	$3\cdot673$	....
20	70	$2^2\cdot5\cdot7\cdot13$	$2\cdot5\cdot11\cdot17$	$2^7\cdot3\cdot5$	$2\cdot5\cdot197$	$2^2\cdot5\cdot101$	$2\cdot3^2\cdot5\cdot23$
21	71	$3\cdot607$	....	$17\cdot113$	$3^3\cdot73$	$43\cdot47$	$19\cdot109$
22	72	$2\cdot911$	$2^4\cdot3^2\cdot13$	$2\cdot31^2$	$2^2\cdot17\cdot29$	$2\cdot3\cdot337$	$2^3\cdot7\cdot37$
23	73	....	....	$3\cdot641$	....	$7\cdot17^2$	$3\cdot691$
24	74	$2^5\cdot3\cdot19$	$2\cdot937$	$2^2\cdot13\cdot37$	$2\cdot3\cdot7\cdot47$	$2^3\cdot11\cdot23$	$2\cdot17\cdot61$
25	75	$5^2\cdot73$	$3\cdot5^4$	$5^2\cdot7\cdot11$	$5^2\cdot79$	$3^4\cdot5^2$	$5^2\cdot83$
26	76	$2\cdot11\cdot83$	$2^2\cdot7\cdot67$	$2\cdot3^2\cdot107$	$2^3\cdot13\cdot19$	$2\cdot1013$	$2^2\cdot3\cdot173$
27	77	$3^2\cdot7\cdot29$	....	$41\cdot47$	$3\cdot659$	....	$31\cdot67$
28	78	$2^2\cdot457$	$2\cdot3\cdot313$	$2^3\cdot241$	$2\cdot23\cdot43$	$2^2\cdot3\cdot13^2$	$2\cdot1039$
29	79	$31\cdot59$	....	$3\cdot643$	....	....	$3^3\cdot7\cdot11$
30	80	$2\cdot3\cdot5\cdot61$	$2^3\cdot5\cdot47$	$2\cdot5\cdot193$	$2^2\cdot3^2\cdot5\cdot11$	$2\cdot5\cdot7\cdot29$	$2^5\cdot5\cdot13$
31	81	....	$3^2\cdot11\cdot19$	....	$7\cdot283$	$3\cdot677$	....
32	82	$2^3\cdot229$	$2\cdot941$	$2^2\cdot3\cdot7\cdot23$	$2\cdot991$	$2^4\cdot127$	$2\cdot3\cdot347$
33	83	$3\cdot13\cdot47$	$7\cdot269$	....	$3\cdot661$	$19\cdot107$	....
34	84	$2\cdot7\cdot131$	$2^2\cdot3\cdot157$	$2\cdot967$	$2^6\cdot31$	$2\cdot3^2\cdot113$	$2^2\cdot521$
35	85	$5\cdot367$	$5\cdot13\cdot29$	$3^2\cdot5\cdot43$	$5\cdot397$	$5\cdot11\cdot37$	$3\cdot5\cdot139$
36	86	$2^2\cdot3^3\cdot17$	$2\cdot23\cdot41$	$2^4\cdot11^2$	$2\cdot3\cdot331$	$2^2\cdot509$	$2\cdot7\cdot149$
37	87	$11\cdot167$	$3\cdot17\cdot37$	$13\cdot149$	....	$3\cdot7\cdot97$	....
38	88	$2\cdot919$	$2^5\cdot59$	$2\cdot3\cdot17\cdot19$	$2^2\cdot7\cdot71$	$2\cdot1019$	$2^3\cdot3^2\cdot29$
39	89	$3\cdot613$	....	$7\cdot277$	$3^2\cdot13\cdot17$	....	....
40	90	$2^4\cdot5\cdot23$	$2\cdot3^3\cdot5\cdot7$	$2^2\cdot5\cdot97$	$2\cdot5\cdot199$	$2^3\cdot3\cdot5\cdot17$	$2\cdot5\cdot11\cdot19$
41	91	$7\cdot263$	$31\cdot61$	$3\cdot647$	$11\cdot181$	$13\cdot157$	$3\cdot17\cdot41$
42	92	$2\cdot3\cdot307$	$2^2\cdot11\cdot43$	$2\cdot971$	$2^3\cdot3\cdot83$	$2\cdot1021$	$2^2\cdot523$
43	93	$19\cdot97$	$3\cdot631$	$29\cdot67$	....	$3^2\cdot227$	$7\cdot13\cdot23$
44	94	$2^2\cdot461$	$2\cdot947$	$2^3\cdot3^5$	$2\cdot997$	$2^2\cdot7\cdot73$	$2\cdot3\cdot349$
45	95	$3^2\cdot5\cdot41$	$5\cdot379$	$5\cdot389$	$3\cdot5\cdot7\cdot19$	$5\cdot409$	$5\cdot419$
46	96	$2\cdot13\cdot71$	$2^3\cdot3\cdot79$	$2\cdot7\cdot139$	$2^2\cdot499$	$2\cdot3\cdot11\cdot31$	$2^4\cdot131$
47	97	....	$7\cdot271$	$3\cdot11\cdot59$	....	$23\cdot89$	$3^2\cdot233$
48	98	$2^3\cdot3\cdot7\cdot11$	$2\cdot13\cdot73$	$2^2\cdot487$	$2\cdot3^3\cdot37$	2^{11}	$2\cdot1049$
49	99	43^2	$3^2\cdot211$	....	....	$3\cdot683$	....
50	100	$2\cdot5^2\cdot37$	$2^2\cdot5^2\cdot19$	$2\cdot3\cdot5^2\cdot13$	$2^4\cdot5^3$	$2\cdot5^2\cdot41$	$2^2\cdot3\cdot5^2\cdot7$

From	To	2100–2150	2150–2200	2200–2250	2250–2300	2300–2350	2350–2400
0	50	$2^2\cdot3\cdot5^2\cdot7$	$2\cdot5^2\cdot43$	$2^3\cdot5^2\cdot11$	$2\cdot3^2\cdot5^3$	$2^2\cdot5^2\cdot23$	$2\cdot5^2\cdot47$
1	51	$11\cdot191$	$3^2\cdot239$	$31\cdot71$	....	$3\cdot13\cdot59$	....
2	52	$2\cdot1051$	$2^3\cdot269$	$2\cdot3\cdot367$	$2^2\cdot563$	$2\cdot1151$	$2^4\cdot3\cdot7^2$
3	53	$3\cdot701$	....	....	$3\cdot751$	$7^2\cdot57$	$13\cdot181$
4	54	$2^3\cdot263$	$2\cdot3\cdot359$	$2^2\cdot19\cdot29$	$2\cdot7^2\cdot23$	$2^8\cdot3^2$	$2\cdot11\cdot107$
5	55	$5\cdot421$	$5\cdot431$	$3^2\cdot5\cdot7^2$	$5\cdot11\cdot41$	$5\cdot461$	$3\cdot5\cdot157$
6	56	$2\cdot3^4\cdot13$	$2^2\cdot7^2\cdot11$	$2\cdot1103$	$2^4\cdot3\cdot47$	$2\cdot1153$	$2^2\cdot19\cdot31$
7	57	$7^2\cdot43$	$3\cdot719$	....	$37\cdot61$	$3\cdot769$	....
8	58	$2^2\cdot17\cdot31$	$2\cdot13\cdot83$	$2^5\cdot3\cdot23$	$2\cdot1129$	$2^2\cdot577$	$2\cdot3^2\cdot131$
9	59	$3\cdot19\cdot37$	$17\cdot127$	47^2	$3^2\cdot251$	....	$7\cdot337$
10	60	$2\cdot5\cdot211$	$2^4\cdot3^3\cdot5$	$2\cdot5\cdot13\cdot17$	$2^2\cdot5\cdot113$	$2\cdot3\cdot5\cdot7\cdot11$	$2^3\cdot5\cdot59$
11	61	....	....	$3\cdot11\cdot67$	$7\cdot17\cdot19$	....	$3\cdot787$
12	62	$2^6\cdot3\cdot11$	$2\cdot23\cdot47$	$2^2\cdot7\cdot79$	$2\cdot3\cdot13\cdot29$	$2^3\cdot17^2$	$2\cdot1181$
13	63	....	$3\cdot7\cdot103$	....	$31\cdot73$	$3^2\cdot257$	$17\cdot139$
14	64	$2\cdot7\cdot151$	$2^2\cdot541$	$2\cdot3^3\cdot41$	$2^3\cdot283$	$2\cdot13\cdot89$	$2^2\cdot3\cdot197$
15	65	$3^2\cdot5\cdot47$	$5\cdot433$	$5\cdot443$	$3\cdot5\cdot151$	$5\cdot463$	$5\cdot11\cdot43$
16	66	$2^2\cdot23^2$	$2\cdot3\cdot19^2$	$2^3\cdot277$	$2\cdot11\cdot103$	$2^2\cdot3\cdot193$	$2\cdot7\cdot13^2$
17	67	$29\cdot73$	$11\cdot197$	$3\cdot739$	....	$7\cdot331$	$3^2\cdot263$
18	68	$2\cdot3\cdot353$	$2^3\cdot271$	$2\cdot1109$	$2^2\cdot3^4\cdot7$	$2\cdot19\cdot61$	$2^6\cdot37$
19	69	$13\cdot163$	$3^2\cdot241$	$7\cdot317$	....	$3\cdot773$	$23\cdot103$
20	70	$2^3\cdot5\cdot53$	$2\cdot5\cdot7\cdot31$	$2^2\cdot3\cdot5\cdot37$	$2\cdot5\cdot227$	$2^4\cdot5\cdot29$	$2\cdot3\cdot5\cdot79$
21	71	$3\cdot7\cdot101$	$13\cdot167$	....	$3\cdot757$	$11\cdot211$	....
22	72	$2\cdot1061$	$2^2\cdot3\cdot181$	$2\cdot11\cdot101$	$2^5\cdot71$	$2\cdot3^3\cdot43$	$2^2\cdot593$
23	73	$11\cdot193$	$41\cdot53$	$3^2\cdot13\cdot19$	....	$23\cdot101$	$3\cdot7\cdot113$
24	74	$2^2\cdot3^2\cdot59$	$2\cdot1087$	$2^4\cdot139$	$2\cdot3\cdot379$	$2^2\cdot7\cdot83$	$2\cdot1187$
25	75	$5^3\cdot17$	$3\cdot5^2\cdot29$	$5^2\cdot89$	$5^2\cdot7\cdot13$	$3\cdot5^2\cdot31$	$5^3\cdot19$
26	76	$2\cdot1063$	$2^7\cdot17$	$2\cdot3\cdot7\cdot53$	$2^2\cdot569$	$2\cdot1163$	$2^3\cdot3^3\cdot11$
27	77	$3\cdot709$	$7\cdot311$	$17\cdot131$	$3^2\cdot11\cdot23$	$13\cdot179$	....
28	78	$2^4\cdot7\cdot19$	$2\cdot3^2\cdot11^2$	$2^2\cdot557$	$2\cdot17\cdot67$	$2^3\cdot3\cdot97$	$2\cdot29\cdot41$
29	79	....	....	$3\cdot743$	$43\cdot53$	$17\cdot137$	$3\cdot13\cdot61$
30	80	$2\cdot3\cdot5\cdot71$	$2^2\cdot5\cdot109$	$2\cdot5\cdot223$	$2^3\cdot3\cdot5\cdot19$	$2\cdot5\cdot233$	$2^2\cdot5\cdot7\cdot17$
31	81	....	$3\cdot727$	$23\cdot97$	....	$3^2\cdot7\cdot37$	....
32	82	$2^2\cdot13\cdot41$	$2\cdot1091$	$2^3\cdot3^2\cdot31$	$2\cdot7\cdot163$	$2^2\cdot11\cdot53$	$2\cdot3\cdot397$
33	83	$3^3\cdot79$	$37\cdot59$	$7\cdot11\cdot29$	$3\cdot761$	....	....
34	84	$2\cdot11\cdot97$	$2^3\cdot3\cdot7\cdot13$	$2\cdot1117$	$2^2\cdot571$	$2\cdot3\cdot389$	$2^4\cdot149$
35	85	$5\cdot7\cdot61$	$5\cdot19\cdot23$	$3\cdot5\cdot149$	$5\cdot457$	$5\cdot467$	$3^2\cdot5\cdot53$
36	86	$2^3\cdot3\cdot89$	$2\cdot1093$	$2^2\cdot13\cdot43$	$2\cdot3^2\cdot127$	$2^5\cdot73$	$2\cdot1193$
37	87	....	3^7	....	....	$3\cdot19\cdot41$	$7\cdot11\cdot31$
38	88	$2\cdot1069$	$2^2\cdot547$	$2\cdot3\cdot373$	$2^4\cdot11\cdot13$	$2\cdot7\cdot167$	$2^2\cdot3\cdot199$
39	89	$3\cdot23\cdot31$	$11\cdot199$	....	$3\cdot7\cdot109$	....	....
40	90	$2^2\cdot5\cdot107$	$2\cdot3\cdot5\cdot73$	$2^6\cdot5\cdot7$	$2\cdot5\cdot229$	$2^2\cdot3^2\cdot5\cdot13$	$2\cdot5\cdot239$
41	91	....	$7\cdot313$	$3^3\cdot83$	$29\cdot79$	....	$3\cdot797$
42	92	$2\cdot3^2\cdot7\cdot17$	$2^4\cdot137$	$2\cdot19\cdot59$	$2^2\cdot3\cdot191$	$2\cdot1171$	$2^3\cdot13\cdot23$
43	93	....	$3\cdot17\cdot43$	....	....	$3\cdot11\cdot71$	....
44	94	$2^5\cdot67$	$2\cdot1097$	$2^2\cdot3\cdot11\cdot17$	$2\cdot31\cdot37$	$2^3\cdot293$	$2\cdot3^2\cdot7\cdot19$
45	95	$3\cdot5\cdot11\cdot13$	$5\cdot439$	$5\cdot449$	$3^3\cdot5\cdot17$	$5\cdot7\cdot67$	$5\cdot479$
46	96	$2\cdot29\cdot37$	$2^2\cdot3^2\cdot61$	$2\cdot1123$	$2^3\cdot7\cdot41$	$2\cdot3\cdot17\cdot23$	$2^2\cdot599$
47	97	$19\cdot113$	13^3	$3\cdot7\cdot107$	....	....	$3\cdot17\cdot47$
48	98	$2^2\cdot3\cdot179$	$2\cdot7\cdot151$	$2^3\cdot281$	$2\cdot3\cdot383$	$2^2\cdot587$	$2\cdot11\cdot109$
49	99	$7\cdot307$	$3\cdot733$	$13\cdot173$	$11^2\cdot19$	$3^4\cdot29$	....
50	100	$2\cdot5^2\cdot43$	$2^3\cdot5^2\cdot11$	$2\cdot3^2\cdot5^3$	$2^2\cdot5^2\cdot23$	$2\cdot5^2\cdot47$	$2^5\cdot3\cdot5^2$

From	To	2400–2450	2450–2500	2500–2550	2550–2600	2600–2650	2650–2700
0	50	$2^5\cdot3\cdot5^2$	$2\cdot5^2\cdot7^2$	$2^2\cdot5^4$	$2\cdot3\cdot5^2\cdot17$	$2^3\cdot5^2\cdot13$	$2\cdot5^2\cdot53$
1	51	7^4	$3\cdot19\cdot43$	$41\cdot61$	....	$3^2\cdot17^2$	$11\cdot241$
2	52	$2\cdot1201$	$2^2\cdot613$	$2\cdot3^2\cdot139$	$2^3\cdot11\cdot29$	$2\cdot1301$	$2^2\cdot3\cdot13\cdot17$
3	53	$3^3\cdot89$	$11\cdot223$	....	$3\cdot23\cdot37$	$19\cdot137$	$7\cdot379$
4	54	$2^2\cdot601$	$2\cdot3\cdot409$	$2^3\cdot313$	$2\cdot1277$	$2^2\cdot3\cdot7\cdot31$	$2\cdot1327$
5	55	$5\cdot13\cdot37$	$5\cdot491$	$3\cdot5\cdot167$	$5\cdot7\cdot73$	$5\cdot521$	$3^2\cdot5\cdot59$
6	56	$2\cdot3\cdot401$	$2^3\cdot307$	$2\cdot7\cdot179$	$2^2\cdot3^2\cdot71$	$2\cdot1303$	$2^5\cdot83$
7	57	$29\cdot83$	$3^3\cdot7\cdot13$	$23\cdot109$	....	$3\cdot11\cdot79$	....
8	58	$2^3\cdot7\cdot43$	$2\cdot1229$	$2^2\cdot3\cdot11\cdot19$	$2\cdot1279$	$2^4\cdot163$	$2\cdot3\cdot443$
9	59	$3\cdot11\cdot73$	....	$13\cdot193$	$3\cdot853$	....	....
10	60	$2\cdot5\cdot241$	$2^2\cdot3\cdot5\cdot41$	$2\cdot5\cdot251$	$2^9\cdot5$	$2\cdot3^2\cdot5\cdot29$	$2^2\cdot5\cdot7\cdot19$
11	61	....	$23\cdot107$	$3^4\cdot31$	$13\cdot197$	$7\cdot373$	$3\cdot887$
12	62	$2^2\cdot3^2\cdot67$	$2\cdot1231$	$2^4\cdot157$	$2\cdot3\cdot7\cdot61$	$2^2\cdot653$	$2\cdot11^3$
13	63	$19\cdot127$	$3\cdot821$	$7\cdot359$	$11\cdot233$	$3\cdot13\cdot67$	....
14	64	$2\cdot17\cdot71$	$2^5\cdot7\cdot11$	$2\cdot3\cdot419$	$2^2\cdot641$	$2\cdot1307$	$2^3\cdot3^2\cdot37$
15	65	$3\cdot5\cdot7\cdot23$	$5\cdot17\cdot29$	$5\cdot503$	$3^3\cdot5\cdot19$	$5\cdot523$	$5\cdot13\cdot41$
16	66	$2^4\cdot151$	$2\cdot3^2\cdot137$	$2^2\cdot17\cdot37$	$2\cdot1283$	$2^3\cdot3\cdot109$	$2\cdot31\cdot43$
17	67	....	....	$3\cdot839$	$17\cdot151$	....	$3\cdot7\cdot127$
18	68	$2\cdot3\cdot13\cdot31$	$2^2\cdot617$	$2\cdot1259$	$2^3\cdot3\cdot107$	$2\cdot7\cdot11\cdot17$	$2^2\cdot23\cdot29$
19	69	$41\cdot59$	$3\cdot823$	$11\cdot229$	$7\cdot367$	$3^3\cdot97$	$17\cdot157$
20	70	$2^2\cdot5\cdot11^2$	$2\cdot5\cdot13\cdot19$	$2^3\cdot3^2\cdot5\cdot7$	$2\cdot5\cdot257$	$2^2\cdot5\cdot131$	$2\cdot3\cdot5\cdot89$
21	71	$3^2\cdot269$	$7\cdot353$	....	$3\cdot857$	....	....
22	72	$2\cdot7\cdot173$	$2^3\cdot3\cdot103$	$2\cdot13\cdot97$	$2^2\cdot643$	$2\cdot3\cdot19\cdot23$	$2^4\cdot167$
23	73	....	....	$3\cdot29^2$	$31\cdot83$	$43\cdot61$	$3^5\cdot11$
24	74	$2^3\cdot3\cdot101$	$2\cdot1237$	$2^2\cdot631$	$2\cdot3^2\cdot11\cdot13$	$2^6\cdot41$	$2\cdot7\cdot191$
25	75	$5^2\cdot97$	$3^2\cdot5^2\cdot11$	$5^2\cdot101$	$5^2\cdot103$	$3\cdot5^3\cdot7$	$5^2\cdot107$
26	76	$2\cdot1213$	$2^2\cdot619$	$2\cdot3\cdot421$	$2^4\cdot7\cdot23$	$2\cdot13\cdot101$	$2^2\cdot3\cdot223$
27	77	$3\cdot809$	....	$7\cdot19^2$	$3\cdot859$	$37\cdot71$	....
28	78	$2^2\cdot607$	$2\cdot3\cdot7\cdot59$	$2^5\cdot79$	$2\cdot1289$	$2^2\cdot3^2\cdot73$	$2\cdot13\cdot103$
29	79	$7\cdot347$	$37\cdot67$	$3^2\cdot281$	....	$11\cdot239$	$3\cdot19\cdot47$
30	80	$2\cdot3^5\cdot5$	$2^4\cdot5\cdot31$	$2\cdot5\cdot11\cdot23$	$2^2\cdot3\cdot5\cdot43$	$2\cdot5\cdot263$	$2^3\cdot5\cdot67$
31	81	$11\cdot13\cdot17$	$3\cdot827$	....	$29\cdot89$	$3\cdot877$	$7\cdot383$
32	82	$2^7\cdot19$	$2\cdot17\cdot73$	$2^2\cdot3\cdot211$	$2\cdot1291$	$2^3\cdot7\cdot47$	$2\cdot3^2\cdot149$
33	83	$3\cdot811$	$13\cdot191$	$17\cdot149$	$3^2\cdot7\cdot41$	....	....
34	84	$2\cdot1217$	$2^2\cdot3^3\cdot23$	$2\cdot7\cdot181$	$2^3\cdot17\cdot19$	$2\cdot3\cdot439$	$2^2\cdot11\cdot61$
35	85	$5\cdot487$	$5\cdot7\cdot71$	$3\cdot5\cdot13^2$	$5\cdot11\cdot47$	$5\cdot17\cdot31$	$3\cdot5\cdot179$
36	86	$2^2\cdot3\cdot7\cdot29$	$2\cdot11\cdot113$	$2^3\cdot317$	$2\cdot3\cdot431$	$2^2\cdot659$	$2\cdot17\cdot79$
37	87	....	$3\cdot829$	$43\cdot59$	$13\cdot199$	$3^2\cdot293$	....
38	88	$2\cdot23\cdot53$	$2^3\cdot311$	$2\cdot3^3\cdot47$	$2^2\cdot647$	$2\cdot1319$	$2^7\cdot3\cdot7$
39	89	$3^2\cdot271$	$19\cdot131$	....	$3\cdot863$	$7\cdot13\cdot29$	....
40	90	$2^3\cdot5\cdot61$	$2\cdot3\cdot5\cdot83$	$2^2\cdot5\cdot127$	$2\cdot5\cdot7\cdot37$	$2^4\cdot3\cdot5\cdot11$	$2\cdot5\cdot269$
41	91	....	$47\cdot53$	$3\cdot7\cdot11^2$	....	$19\cdot139$	$3^2\cdot13\cdot23$
42	92	$2\cdot3\cdot11\cdot37$	$2^2\cdot7\cdot89$	$2\cdot31\cdot41$	$2^5\cdot3^4$	$2\cdot1321$	$2^2\cdot673$
43	93	$7\cdot349$	$3^2\cdot277$	....	....	$3\cdot881$	....
44	94	$2^2\cdot13\cdot47$	$2\cdot29\cdot43$	$2^4\cdot3\cdot53$	$2\cdot1297$	$2^2\cdot661$	$2\cdot3\cdot449$
45	95	$3\cdot5\cdot163$	$5\cdot499$	$5\cdot509$	$3\cdot5\cdot173$	$5\cdot23^2$	$5\cdot7^2\cdot11$
46	96	$2\cdot1223$	$2^6\cdot3\cdot13$	$2\cdot19\cdot67$	$2^2\cdot11\cdot59$	$2\cdot3^3\cdot7^2$	$2^3\cdot337$
47	97	....	$11\cdot227$	$3^2\cdot283$	$7^2\cdot53$	....	$3\cdot29\cdot31$
48	98	$2^4\cdot3^2\cdot17$	$2\cdot1249$	$2^2\cdot7^2\cdot13$	$2\cdot3\cdot433$	$2^3\cdot331$	$2\cdot19\cdot71$
49	99	$31\cdot79$	$3\cdot7^2\cdot17$	....	$23\cdot113$	$3\cdot883$	....
50	100	$2\cdot5^2\cdot7^2$	$2^2\cdot5^4$	$2\cdot3\cdot5^2\cdot17$	$2^3\cdot5^2\cdot13$	$2\cdot5^2\cdot53$	$2^2\cdot3^3\cdot5^2$

From		2700	2750	2800	2850	2900	2950
To		2750	2800	2850	2900	2950	3000
0	50	$2^2\cdot3^3\cdot5^2$	$2\cdot5^3\cdot11$	$2^4\cdot5^2\cdot7$	$2\cdot3\cdot5^2\cdot19$	$2^2\cdot5^2\cdot29$	$2\cdot5^2\cdot59$
1	51	37·73	3·7·131	....	....	3·967	13·227
2	52	2·7·193	$2^6\cdot43$	2·3·467	$2^2\cdot23\cdot31$	2·1451	$2^3\cdot3^2\cdot41$
3	53	3·17·53	....	....	$3^2\cdot317$	....	....
4	54	$2^4\cdot13^2$	$2\cdot3^4\cdot17$	$2^2\cdot701$	2·1427	$2^3\cdot3\cdot11^2$	2·7·211
5	55	5·541	5·19·29	3·5·11·17	5·571	5·7·83	3·5·197
6	56	2·3·11·41	$2^2\cdot13\cdot53$	2·23·61	$2^3\cdot3\cdot7\cdot17$	2·1453	$2^2\cdot739$
7	57	....	3·919	7·401	....	$3^2\cdot17\cdot19$	....
8	58	$2^2\cdot677$	2·7·197	$2^3\cdot3^3\cdot13$	2·1429	$2^2\cdot727$	2·3·17·29
9	59	$3^2\cdot7\cdot43$	31·89	53^2	3·953	....	11·269
10	60	2·5·271	$2^3\cdot3\cdot5\cdot23$	2·5·281	$2^2\cdot5\cdot11\cdot13$	2·3·5·97	$2^4\cdot5\cdot37$
11	61	....	11·251	3·937	....	41·71	$3^2\cdot7\cdot47$
12	62	$2^3\cdot3\cdot113$	2·1381	$2^2\cdot19\cdot37$	$2\cdot3^3\cdot53$	$2^5\cdot7\cdot13$	2·1481
13	63	....	$3^2\cdot307$	29·97	7·409	3·971	....
14	64	2·23·59	$2^2\cdot691$	2·3·7·67	$2^4\cdot179$	2·31·47	$2^2\cdot3\cdot13\cdot19$
15	65	3·5·181	5·7·79	5·563	3·5·191	5·11·53	5·593
16	66	$2^2\cdot7\cdot97$	2·3·461	$2^8\cdot11$	2·1433	$2^2\cdot3^6$	2·1483
17	67	11·13·19	....	$3^2\cdot313$	47·61	....	3·23·43
18	68	$2\cdot3^2\cdot151$	$2^4\cdot173$	2·1409	$2^2\cdot3\cdot239$	2·1459	$2^3\cdot7\cdot53$
19	69	....	3·13·71	....	19·151	3·7·139	....
20	70	$2^5\cdot5\cdot17$	2·5·277	$2^2\cdot3\cdot5\cdot47$	2·5·7·41	$2^3\cdot5\cdot73$	$2\cdot3^3\cdot5\cdot11$
21	71	3·907	17·163	7·13·31	$3^2\cdot11\cdot29$	23·127	....
22	72	2·1361	$2^2\cdot3^2\cdot7\cdot11$	2·17·83	$2^3\cdot359$	2·3·487	$2^2\cdot743$
23	73	7·389	47·59	3·941	$13^2\cdot17$	37·79	3·991
24	74	$2^2\cdot3\cdot227$	2·19·73	$2^3\cdot353$	2·3·479	$2^2\cdot17\cdot43$	2·1487
25	75	$5^2\cdot109$	$3\cdot5^2\cdot37$	$5^2\cdot113$	$5^3\cdot23$	$3^2\cdot5^2\cdot13$	$5^2\cdot7\cdot17$
26	76	2·29·47	$2^3\cdot347$	$2\cdot3^2\cdot157$	$2^2\cdot719$	2·7·11·19	$2^5\cdot3\cdot31$
27	77	$3^3\cdot101$	....	11·257	3·7·137	....	13·229
28	78	$2^3\cdot11\cdot31$	2·3·463	$2^2\cdot7\cdot101$	2·1439	$2^4\cdot3\cdot61$	2·1489
29	79	....	7·397	3·23·41	....	29·101	$3^2\cdot331$
30	80	2·3·5·7·13	$2^2\cdot5\cdot139$	2·5·283	$2^6\cdot3^2\cdot5$	2·5·293	$2^2\cdot5\cdot149$
31	81	....	$3^3\cdot103$	19·149	43·67	3·977	11·271
32	82	$2^2\cdot683$	2·13·107	$2^4\cdot3\cdot59$	2·11·131	$2^2\cdot733$	2·3·7·71
33	83	3·911	$11^2\cdot23$	....	$3\cdot31^2$	7·419	19·157
34	84	2·1367	$2^5\cdot3\cdot29$	2·13·109	$2^2\cdot7\cdot103$	$2\cdot3^2\cdot163$	$2^3\cdot373$
35	85	5·547	5·557	$3^4\cdot5\cdot7$	5·577	5·587	3·5·199
36	86	$2^4\cdot3^2\cdot19$	2·7·199	$2^2\cdot709$	2·3·13·37	$2^3\cdot367$	2·1493
37	87	7·17·23	3·929	....	....	3·11·89	29·103
38	88	$2\cdot37^2$	$2^2\cdot17\cdot41$	2·3·11·43	$2^3\cdot19^2$	2·13·113	$2^2\cdot3^2\cdot83$
39	89	3·11·83	....	17·167	$3^3\cdot107$	....	$7^2\cdot61$
40	90	$2^2\cdot5\cdot137$	$2\cdot3^2\cdot5\cdot31$	$2^3\cdot5\cdot71$	$2\cdot5\cdot17^2$	$2^2\cdot3\cdot5\cdot7^2$	2·5·13·23
41	91	....	....	3·947	$7^2\cdot59$	17·173	3·997
42	92	2·3·457	$2^3\cdot349$	$2\cdot7^2\cdot29$	$2^2\cdot3\cdot241$	2·1471	$2^4\cdot11\cdot17$
43	93	13·211	$3\cdot7^2\cdot19$	....	11·263	$3^3\cdot109$	41·73
44	94	$2^3\cdot7^3$	2·11·127	$2^2\cdot3^2\cdot79$	2·1447	$2^7\cdot23$	2·3·499
45	95	$3^2\cdot5\cdot61$	5·13·43	5·569	3·5·193	5·19·31	5·599
46	96	2·1373	$2^2\cdot3\cdot233$	2·1423	$2^4\cdot181$	2·3·491	$2^2\cdot7\cdot107$
47	97	41·67	....	3·13·73	....	7·421	$3^4\cdot37$
48	98	$2^2\cdot3\cdot229$	3·1399	$2^5\cdot89$	$2\cdot3^2\cdot7\cdot23$	$2^2\cdot11\cdot67$	2·1499
49	99	....	$3^2\cdot311$	7·11·37	13·223	3·983	....
50	100	$2\cdot5^3\cdot11$	$2^4\cdot5^2\cdot7$	$2\cdot3\cdot5^2\cdot19$	$2^2\cdot5^2\cdot29$	$2\cdot5^2\cdot59$	$2^3\cdot3\cdot5^3$

From		3000	3050	3100	3150	3200	3250
To		**3050**	**3100**	**3150**	**3200**	**3250**	**3300**
0	50	$2^3\cdot3\cdot5^3$	$2\cdot5^2\cdot61$	$2^2\cdot5^2\cdot31$	$2\cdot3^2\cdot5^2\cdot7$	$2^7\cdot5^2$	$2\cdot5^3\cdot13$
1	51	....	$3^3\cdot113$	$7\cdot443$	$23\cdot137$	$3\cdot11\cdot97$	....
2	52	$2\cdot19\cdot79$	$2^2\cdot7\cdot109$	$2\cdot3\cdot11\cdot47$	$2^4\cdot197$	$2\cdot1601$	$2^2\cdot3\cdot271$
3	53	$3\cdot7\cdot11\cdot13$	$43\cdot71$	$29\cdot107$	$3\cdot1051$	....	....
4	54	$2^2\cdot751$	$2\cdot3\cdot509$	$2^5\cdot97$	$2\cdot19\cdot83$	$2^2\cdot3^2\cdot89$	$2\cdot1627$
5	55	$5\cdot601$	$5\cdot13\cdot47$	$3^3\cdot5\cdot23$	$5\cdot631$	$5\cdot641$	$3\cdot5\cdot7\cdot31$
6	56	$2\cdot3^2\cdot167$	$2^4\cdot191$	$2\cdot1553$	$2^2\cdot3\cdot263$	$2\cdot7\cdot229$	$2^3\cdot11\cdot37$
7	57	$31\cdot97$	$3\cdot1019$	$13\cdot239$	$7\cdot11\cdot41$	$3\cdot1069$	....
8	58	$2^6\cdot47$	$2\cdot11\cdot139$	$2^2\cdot3\cdot7\cdot37$	$2\cdot1579$	$2^3\cdot401$	$2\cdot3^2\cdot181$
9	59	$3\cdot17\cdot59$	$7\cdot19\cdot23$	....	$3^5\cdot13$	....	....
10	60	$2\cdot5\cdot7\cdot43$	$2^2\cdot3^2\cdot5\cdot17$	$2\cdot5\cdot311$	$2^3\cdot5\cdot79$	$2\cdot3\cdot5\cdot107$	$2^2\cdot5\cdot163$
11	61	....	....	$3\cdot17\cdot61$	$29\cdot109$	$13^2\cdot19$	$3\cdot1087$
12	62	$2^2\cdot3\cdot251$	$2\cdot1531$	$2^3\cdot389$	$2\cdot3\cdot17\cdot31$	$2^2\cdot11\cdot73$	$2\cdot7\cdot233$
13	63	$23\cdot131$	$3\cdot1021$	$11\cdot283$	....	$3^3\cdot7\cdot17$	$13\cdot251$
14	64	$2\cdot11\cdot137$	$2^3\cdot383$	$2\cdot3^2\cdot173$	$2^2\cdot7\cdot113$	$2\cdot1607$	$2^6\cdot3\cdot17$
15	65	$3^2\cdot5\cdot67$	$5\cdot613$	$5\cdot7\cdot89$	$3\cdot5\cdot211$	$5\cdot643$	$5\cdot653$
16	66	$2^3\cdot13\cdot29$	$2\cdot3\cdot7\cdot73$	$2^2\cdot19\cdot41$	$2\cdot1583$	$2^4\cdot3\cdot67$	$2\cdot23\cdot71$
17	67	$7\cdot431$	....	$3\cdot1039$	....	....	$3^3\cdot11^2$
18	68	$2\cdot3\cdot503$	$2^2\cdot13\cdot59$	$2\cdot1559$	$2^5\cdot3^2\cdot11$	$2\cdot1609$	$2^2\cdot19\cdot43$
19	69	....	$3^2\cdot11\cdot31$	....	....	$3\cdot29\cdot37$	$7\cdot467$
20	70	$2^2\cdot5\cdot151$	$2\cdot5\cdot307$	$2^4\cdot3\cdot5\cdot13$	$2\cdot5\cdot317$	$2^2\cdot5\cdot7\cdot23$	$2\cdot3\cdot5\cdot109$
21	71	$3\cdot19\cdot53$	$37\cdot83$	....	$3\cdot7\cdot151$	....	....
22	72	$2\cdot1511$	$2^{10}\cdot3$	$2\cdot7\cdot223$	$2^2\cdot13\cdot61$	$2\cdot3^2\cdot179$	$2^3\cdot409$
23	73	....	$7\cdot439$	$3^2\cdot347$	$19\cdot167$	$11\cdot293$	$3\cdot1091$
24	74	$2^4\cdot3^3\cdot7$	$2\cdot29\cdot53$	$2^2\cdot11\cdot71$	$2\cdot3\cdot23^2$	$2^3\cdot13\cdot31$	$2\cdot1637$
25	75	$5^2\cdot11^2$	$3\cdot5^2\cdot41$	5^5	$5^2\cdot127$	$3\cdot5^2\cdot43$	$5^2\cdot131$
26	76	$2\cdot17\cdot89$	$2^2\cdot769$	$2\cdot3\cdot521$	$2^3\cdot397$	$2\cdot1613$	$2^2\cdot3^2\cdot7\cdot13$
27	77	$3\cdot1009$	$17\cdot181$	$53\cdot59$	$3^2\cdot353$	$7\cdot461$	$29\cdot113$
28	78	$2^2\cdot757$	$2\cdot3^4\cdot19$	$2^3\cdot17\cdot23$	$2\cdot7\cdot227$	$2^2\cdot3\cdot269$	$2\cdot11\cdot149$
29	79	$13\cdot233$	....	$3\cdot7\cdot149$	$11\cdot17^2$	....	$3\cdot1093$
30	80	$2\cdot3\cdot5\cdot101$	$2^3\cdot5\cdot7\cdot11$	$2\cdot5\cdot313$	$2^2\cdot3\cdot5\cdot53$	$2\cdot5\cdot17\cdot19$	$2^4\cdot5\cdot41$
31	81	$7\cdot433$	$3\cdot13\cdot79$	$31\cdot101$	....	$3^2\cdot359$	$17\cdot193$
32	82	$2^3\cdot379$	$2\cdot23\cdot67$	$2^2\cdot3^3\cdot29$	$2\cdot37\cdot43$	$2^5\cdot101$	$2\cdot3\cdot547$
33	83	$3^2\cdot337$	....	$13\cdot241$	$3\cdot1061$	$53\cdot61$	$7^2\cdot67$
34	84	$2\cdot37\cdot41$	$2^2\cdot3\cdot257$	$2\cdot1567$	$2^4\cdot199$	$2\cdot3\cdot7^2\cdot11$	$2^2\cdot821$
35	85	$5\cdot607$	$5\cdot617$	$3\cdot5\cdot11\cdot19$	$5\cdot7^2\cdot13$	$5\cdot647$	$3^2\cdot5\cdot73$
36	86	$2^2\cdot3\cdot11\cdot23$	$2\cdot1543$	$2^6\cdot7^2$	$2\cdot3^3\cdot59$	$2^2\cdot809$	$2\cdot31\cdot53$
37	87	....	$3^2\cdot7^3$	....	....	$3\cdot13\cdot83$	$19\cdot173$
38	88	$2\cdot7^2\cdot31$	$2^4\cdot193$	$2\cdot3\cdot523$	$2^2\cdot797$	$2\cdot1619$	$2^3\cdot3\cdot137$
39	89	$3\cdot1013$	....	$43\cdot73$	$3\cdot1063$	$41\cdot79$	$11\cdot13\cdot23$
40	90	$2^5\cdot5\cdot19$	$2\cdot3\cdot5\cdot103$	$2^2\cdot5\cdot157$	$2\cdot5\cdot11\cdot29$	$2^3\cdot3^4\cdot5$	$2\cdot5\cdot7\cdot47$
41	91	....	$11\cdot281$	$3^2\cdot349$	....	$7\cdot463$	$3\cdot1097$
42	92	$2\cdot3^2\cdot13^2$	$2^2\cdot773$	$2\cdot1571$	$2^3\cdot3\cdot7\cdot19$	$2\cdot1621$	$2^2\cdot823$
43	93	$17\cdot179$	$3\cdot1031$	$7\cdot449$	$31\cdot103$	$3\cdot23\cdot47$	$37\cdot89$
44	94	$2^2\cdot761$	$2\cdot7\cdot13\cdot17$	$2^3\cdot3\cdot131$	$2\cdot1597$	$2^2\cdot811$	$2\cdot3^3\cdot61$
45	95	$3\cdot5\cdot7\cdot29$	$5\cdot619$	$5\cdot17\cdot37$	$3^2\cdot5\cdot71$	$5\cdot11\cdot59$	$5\cdot659$
46	96	$2\cdot1523$	$2^3\cdot3^2\cdot43$	$2\cdot11^2\cdot13$	$2^2\cdot17\cdot47$	$2\cdot3\cdot541$	$2^5\cdot103$
47	97	$11\cdot277$	$19\cdot163$	$3\cdot1049$	$23\cdot139$	$17\cdot191$	$3\cdot7\cdot157$
48	98	$2^3\cdot3\cdot127$	$2\cdot1549$	$2^2\cdot787$	$2\cdot3\cdot13\cdot41$	$2^4\cdot7\cdot29$	$2\cdot17\cdot97$
49	99	....	$3\cdot1033$	$47\cdot67$	$7\cdot457$	$3^2\cdot19^2$	....
50	100	$2\cdot5^2\cdot61$	$2^2\cdot5^2\cdot31$	$2\cdot3^2\cdot5^2\cdot7$	$2^7\cdot5^2$	$2\cdot5^3\cdot13$	$2^2\cdot3\cdot5^2\cdot11$

From	To	3300 3350	3350 3400	3400 3450	3450 3500	3500 3550	3550 3600
0	50	$2^2\cdot3\cdot5^2\cdot11$	$2\cdot5^2\cdot67$	$2^3\cdot5^2\cdot17$	$2\cdot3\cdot5^2\cdot23$	$2^2\cdot5^3\cdot7$	$2\cdot5^2\cdot71$
1	51	....	$3\cdot1117$	$19\cdot179$	$7\cdot17\cdot29$	$3^2\cdot389$	$53\cdot67$
2	52	$2\cdot13\cdot127$	$2^3\cdot419$	$2\cdot3^5\cdot7$	$2^2\cdot863$	$2\cdot17\cdot103$	$2^5\cdot3\cdot37$
3	53	$3^2\cdot367$	$7\cdot479$	$41\cdot83$	$3\cdot1151$	$31\cdot113$	$11\cdot17\cdot19$
4	54	$2^3\cdot7\cdot59$	$2\cdot3\cdot13\cdot43$	$2^2\cdot23\cdot37$	$2\cdot11\cdot157$	$2^4\cdot3\cdot73$	$2\cdot1777$
5	55	$5\cdot661$	$5\cdot11\cdot61$	$3\cdot5\cdot227$	$5\cdot691$	$5\cdot701$	$3^2\cdot5\cdot79$
6	56	$2\cdot3\cdot19\cdot29$	$2^2\cdot839$	$2\cdot13\cdot131$	$2^7\cdot3^3$	$2\cdot1753$	$2^2\cdot7\cdot127$
7	57	....	$3^2\cdot373$	....	....	$3\cdot7\cdot167$	....
8	58	$2^2\cdot827$	$2\cdot23\cdot73$	$2^4\cdot3\cdot71$	$2\cdot7\cdot13\cdot19$	$2^2\cdot877$	$2\cdot3\cdot593$
9	59	$3\cdot1103$	....	$7\cdot487$	$3\cdot1153$	$11^2\cdot29$	....
10	60	$2\cdot5\cdot331$	$2^5\cdot3\cdot5\cdot7$	$2\cdot5\cdot11\cdot31$	$2^2\cdot5\cdot173$	$2\cdot3^3\cdot5\cdot13$	$2^3\cdot5\cdot89$
11	61	$7\cdot11\cdot43$	....	$3^2\cdot379$	....	....	$3\cdot1187$
12	62	$2^4\cdot3^2\cdot23$	$2\cdot41^2$	$2^2\cdot853$	$2\cdot3\cdot577$	$2^3\cdot439$	$2\cdot13\cdot137$
13	63	....	$3\cdot19\cdot59$	....	....	$3\cdot1171$	$7\cdot509$
14	64	$2\cdot1657$	$2^2\cdot29^2$	$2\cdot3\cdot569$	$2^3\cdot433$	$2\cdot7\cdot251$	$2^2\cdot3^4\cdot11$
15	65	$3\cdot5\cdot13\cdot17$	$5\cdot673$	$5\cdot683$	$3^2\cdot5\cdot7\cdot11$	$5\cdot19\cdot37$	$5\cdot23\cdot31$
16	66	$2^2\cdot829$	$2\cdot3^2\cdot11\cdot17$	$2^3\cdot7\cdot61$	$2\cdot1733$	$2^2\cdot3\cdot293$	$2\cdot1783$
17	67	$31\cdot107$	$7\cdot13\cdot37$	$3\cdot17\cdot67$	....	....	$3\cdot29\cdot41$
18	68	$2\cdot3\cdot7\cdot79$	$2^3\cdot421$	$2\cdot1709$	$2^2\cdot3\cdot17^2$	$2\cdot1759$	$2^4\cdot223$
19	69	....	$3\cdot1123$	$13\cdot263$	....	$3^2\cdot17\cdot23$	$43\cdot83$
20	70	$2^3\cdot5\cdot83$	$2\cdot5\cdot337$	$2^2\cdot3^2\cdot5\cdot19$	$2\cdot5\cdot347$	$2^6\cdot5\cdot11$	$2\cdot3\cdot5\cdot7\cdot17$
21	71	$3^4\cdot41$	....	$11\cdot311$	$3\cdot13\cdot89$	$7\cdot503$	....
22	72	$2\cdot11\cdot151$	$2^2\cdot3\cdot281$	$2\cdot29\cdot59$	$2^4\cdot7\cdot31$	$2\cdot3\cdot587$	$2^2\cdot19\cdot47$
23	73	....	....	$3\cdot7\cdot163$	$23\cdot151$	$13\cdot271$	$3^2\cdot397$
24	74	$2^2\cdot3\cdot277$	$2\cdot7\cdot241$	$2^5\cdot107$	$2\cdot3^2\cdot193$	$2^2\cdot881$	$2\cdot1787$
25	75	$5^2\cdot7\cdot19$	$3^3\cdot5^3$	$5^2\cdot137$	$5^2\cdot139$	$3\cdot5^2\cdot47$	$5^2\cdot11\cdot13$
26	76	$2\cdot1663$	$2^4\cdot211$	$2\cdot3\cdot571$	$2^2\cdot11\cdot79$	$2\cdot41\cdot43$	$2^3\cdot3\cdot149$
27	77	$3\cdot1109$	$11\cdot307$	$23\cdot149$	$3\cdot19\cdot61$	....	$7^2\cdot73$
28	78	$2^8\cdot13$	$2\cdot3\cdot563$	$2^2\cdot857$	$2\cdot37\cdot47$	$2^3\cdot3^2\cdot7^2$	$2\cdot1789$
29	79	....	$31\cdot109$	$3^3\cdot127$	$7^2\cdot71$	....	$3\cdot1193$
30	80	$2\cdot3^2\cdot5\cdot37$	$2^2\cdot5\cdot13^2$	$2\cdot5\cdot7^3$	$2^3\cdot3\cdot5\cdot29$	$2\cdot5\cdot353$	$2^2\cdot5\cdot179$
31	81	....	$3\cdot7^2\cdot23$	$47\cdot73$	59^2	$3\cdot11\cdot107$	....
32	82	$2^2\cdot7^2\cdot17$	$2\cdot19\cdot89$	$2^3\cdot3\cdot11\cdot13$	$2\cdot1741$	$2^2\cdot883$	$2\cdot3^2\cdot199$
33	83	$3\cdot11\cdot101$	$17\cdot199$	....	$3^4\cdot43$	....	....
34	84	$2\cdot1667$	$2^3\cdot3^2\cdot47$	$2\cdot17\cdot101$	$2^2\cdot13\cdot67$	$2\cdot3\cdot19\cdot31$	$2^9\cdot7$
35	85	$5\cdot23\cdot29$	$5\cdot677$	$3\cdot5\cdot229$	$5\cdot17\cdot41$	$5\cdot7\cdot101$	$3\cdot5\cdot239$
36	86	$2^3\cdot3\cdot139$	$2\cdot1693$	$2^2\cdot859$	$2\cdot3\cdot7\cdot83$	$2^4\cdot13\cdot17$	$2\cdot11\cdot163$
37	87	$47\cdot71$	$3\cdot1129$	$7\cdot491$	$11\cdot317$	$3^3\cdot131$	$17\cdot211$
38	88	$2\cdot1669$	$2^2\cdot7\cdot11^2$	$2\cdot3^2\cdot191$	$2^5\cdot109$	$2\cdot29\cdot61$	$2^2\cdot3\cdot13\cdot23$
39	89	$3^2\cdot7\cdot53$	....	$19\cdot181$	$3\cdot1163$	....	$37\cdot97$
40	90	$2^2\cdot5\cdot167$	$2\cdot3\cdot5\cdot113$	$2^4\cdot5\cdot43$	$2\cdot5\cdot349$	$2^2\cdot3\cdot5\cdot59$	$2\cdot5\cdot359$
41	91	$13\cdot257$	....	$3\cdot31\cdot37$	....	....	$3^3\cdot7\cdot19$
42	92	$2\cdot3\cdot557$	$2^6\cdot53$	$2\cdot1721$	$2^2\cdot3^2\cdot97$	$2\cdot7\cdot11\cdot23$	$2^3\cdot449$
43	93	....	$3^2\cdot13\cdot29$	$11\cdot313$	$7\cdot499$	$3\cdot1181$	....
44	94	$2^4\cdot11\cdot19$	$2\cdot1697$	$2^2\cdot3\cdot7\cdot41$	$2\cdot1747$	$2^3\cdot443$	$2\cdot3\cdot599$
45	95	$3\cdot5\cdot223$	$5\cdot7\cdot97$	$5\cdot13\cdot53$	$3\cdot5\cdot233$	$5\cdot709$	$5\cdot719$
46	96	$2\cdot7\cdot239$	$2^2\cdot3\cdot283$	$2\cdot1723$	$2^3\cdot19\cdot23$	$2\cdot3^2\cdot197$	$2^2\cdot29\cdot31$
47	97	....	$43\cdot79$	$3^2\cdot383$	$13\cdot269$	....	$3\cdot11\cdot109$
48	98	$2^2\cdot3^3\cdot31$	$2\cdot1699$	$2^3\cdot431$	$2\cdot3\cdot11\cdot53$	$2^2\cdot887$	$2\cdot7\cdot257$
49	99	$17\cdot197$	$3\cdot11\cdot103$	....	....	$3\cdot7\cdot13^2$	$59\cdot61$
50	100	$2\cdot5^2\cdot67$	$2^3\cdot5^2\cdot17$	$2\cdot3\cdot5^2\cdot23$	$2^2\cdot5^3\cdot7$	$2\cdot5^2\cdot71$	$2^4\cdot3^2\cdot5^2$

From	To	3600 3650	3650 3700	3700 3750	3750 3800	3800 3850	3850 3900
0	50	$2^{4}\cdot 3^{2}\cdot 5^{2}$	$2\cdot 5^{2}\cdot 73$	$2^{2}\cdot 5^{2}\cdot 37$	$2\cdot 3\cdot 5^{4}$	$2^{3}\cdot 5^{2}\cdot 19$	$2\cdot 5^{2}\cdot 7\cdot 11$
1	51	13·277	3·1217	....	$11^{2}\cdot 31$	3·7·181	....
2	52	2·1801	$2^{2}\cdot 11\cdot 83$	2·3·617	$2^{3}\cdot 7\cdot 67$	2·1901	$2^{2}\cdot 3^{2}\cdot 107$
3	53	3·1201	13·281	$7\cdot 23^{2}$	$3^{3}\cdot 139$	....	....
4	54	$2^{2}\cdot 17\cdot 53$	$2\cdot 3^{2}\cdot 7\cdot 29$	$2^{3}\cdot 463$	2·1877	$2^{2}\cdot 3\cdot 317$	2·41·47
5	55	5·7·103	5·17·43	3·5·13·19	5·751	5·761	3·5·257
6	56	2·3·601	$2^{3}\cdot 457$	2·17·109	$2^{2}\cdot 3\cdot 313$	2·11·173	$2^{4}\cdot 241$
7	57	....	3·23·53	11·337	$13\cdot 17^{2}$	$3^{4}\cdot 47$	7·19·29
8	58	$2^{3}\cdot 11\cdot 41$	2·31·59	$2^{2}\cdot 3^{2}\cdot 103$	2·1879	$2^{5}\cdot 7\cdot 17$	2·3·643
9	59	$3^{2}\cdot 401$	....	....	3·7·179	13·293	17·227
10	60	$2\cdot 5\cdot 19^{2}$	$2^{2}\cdot 3\cdot 5\cdot 61$	2·5·7·53	$2^{4}\cdot 5\cdot 47$	2·3·5·127	$2^{2}\cdot 5\cdot 193$
11	61	23·157	7·523	3·1237	....	37·103	$3^{3}\cdot 11\cdot 13$
12	62	$2^{2}\cdot 3\cdot 7\cdot 43$	2·1831	$2^{7}\cdot 29$	$2\cdot 3^{2}\cdot 11\cdot 19$	$2^{2}\cdot 953$	2·1931
13	63	....	$3^{2}\cdot 11\cdot 37$	47·79	53·71	3·31·41	....
14	64	2·13·139	$2^{4}\cdot 229$	2·3·619	$2^{2}\cdot 941$	2·1907	$2^{3}\cdot 3\cdot 7\cdot 23$
15	65	3·5·241	5·733	5·743	3·5·251	5·7·109	5·773
16	66	$2^{5}\cdot 113$	2·3·13·47	$2^{2}\cdot 929$	2·7·269	$2^{3}\cdot 3^{2}\cdot 53$	2·1933
17	67	....	19·193	$3^{2}\cdot 7\cdot 59$	....	11·347	3·1289
18	68	$2\cdot 3^{3}\cdot 67$	$2^{2}\cdot 7\cdot 131$	$2\cdot 11\cdot 13^{2}$	$2^{3}\cdot 3\cdot 157$	2·23·83	$2^{2}\cdot 967$
19	69	7·11·47	3·1223	....	....	3·19·67	53·73
20	70	$2^{2}\cdot 5\cdot 181$	2·5·367	$2^{3}\cdot 3\cdot 5\cdot 31$	2·5·13·29	$2^{2}\cdot 5\cdot 191$	$2\cdot 3^{2}\cdot 5\cdot 43$
21	71	3·17·71	....	61^{2}	$3^{2}\cdot 419$	....	$7^{2}\cdot 79$
22	72	2·1811	$2^{3}\cdot 3^{3}\cdot 17$	2·1861	$2^{2}\cdot 23\cdot 41$	$2\cdot 3\cdot 7^{2}\cdot 13$	$2^{5}\cdot 11^{2}$
23	73	....	....	3·17·73	$7^{3}\cdot 11$	....	3·1291
24	74	$2^{3}\cdot 3\cdot 151$	2·11·167	$2^{2}\cdot 7^{2}\cdot 19$	2·3·17·37	$2^{4}\cdot 239$	2·13·149
25	75	$5^{3}\cdot 29$	$3\cdot 5^{2}\cdot 7^{2}$	$5^{2}\cdot 149$	$5^{2}\cdot 151$	$3^{2}\cdot 5^{2}\cdot 17$	$5^{3}\cdot 31$
26	76	$2\cdot 7^{2}\cdot 37$	$2^{2}\cdot 919$	$2\cdot 3^{4}\cdot 23$	$2^{6}\cdot 59$	2·1913	$2^{2}\cdot 3\cdot 17\cdot 19$
27	77	$3^{2}\cdot 13\cdot 31$	....	....	3·1259	43·89	....
28	78	$2^{2}\cdot 907$	2·3·613	$2^{4}\cdot 233$	2·1889	$2^{2}\cdot 3\cdot 11\cdot 29$	2·7·277
29	79	19·191	13·283	3·11·113	....	7·547	$3^{2}\cdot 431$
30	80	$2\cdot 3\cdot 5\cdot 11^{2}$	$2^{5}\cdot 5\cdot 23$	2·5·373	$2^{2}\cdot 3^{3}\cdot 5\cdot 7$	2·5·383	$2^{3}\cdot 5\cdot 97$
31	81	....	$3^{2}\cdot 409$	7·13·41	19·199	3·1277	....
32	82	$2^{4}\cdot 227$	2·7·263	$2^{2}\cdot 3\cdot 311$	2·31·61	$2^{3}\cdot 479$	2·3·647
33	83	3·7·173	29·127	....	3·13·97	....	11·353
34	84	2·23·79	$2^{2}\cdot 3\cdot 307$	2·1867	$2^{3}\cdot 11\cdot 43$	$2\cdot 3^{3}\cdot 71$	$2^{2}\cdot 971$
35	85	5·727	5·11·67	$3^{2}\cdot 5\cdot 83$	5·757	5·13·59	3·5·7·37
36	86	$2^{2}\cdot 3^{2}\cdot 101$	2·19·97	$2^{3}\cdot 467$	2·3·631	$2^{2}\cdot 7\cdot 137$	2·29·67
37	87	....	3·1229	37·101	7·541	3·1279	$13^{2}\cdot 23$
38	88	2·17·107	$2^{3}\cdot 461$	2·3·7·89	$2^{2}\cdot 947$	2·19·101	$2^{4}\cdot 3^{5}$
39	89	3·1213	7·17·31	....	$3^{2}\cdot 421$	11·349	....
40	90	$2^{3}\cdot 5\cdot 7\cdot 13$	$2\cdot 3^{2}\cdot 5\cdot 41$	$2^{2}\cdot 5\cdot 11\cdot 17$	2·5·379	$2^{8}\cdot 3\cdot 5$	2·5·389
41	91	11·331	....	3·29·43	17·223	23·167	3·1297
42	92	2·3·607	$2^{2}\cdot 13\cdot 71$	2·1871	$2^{4}\cdot 3\cdot 79$	2·17·113	$2^{2}\cdot 7\cdot 139$
43	93	....	3·1231	19·197	....	$3^{2}\cdot 7\cdot 61$	17·229
44	94	$2^{2}\cdot 911$	2·1847	$2^{5}\cdot 3^{2}\cdot 13$	2·7·271	$2^{2}\cdot 31^{2}$	2·3·11·59
45	95	$3^{6}\cdot 5$	5·739	5·7·107	3·5·11·23	5·769	5·19·41
46	96	2·1823	$2^{4}\cdot 3\cdot 7\cdot 11$	2·1873	$2^{2}\cdot 13\cdot 73$	2·3·641	$2^{3}\cdot 487$
47	97	7·521	....	3·1249	....	....	$3^{2}\cdot 433$
48	98	$2^{6}\cdot 3\cdot 19$	$2\cdot 43^{2}$	$2^{2}\cdot 937$	$2\cdot 3^{2}\cdot 211$	$2^{3}\cdot 13\cdot 37$	2·1949
49	99	41·89	$3^{3}\cdot 137$	23·163	29·131	3·1283	7·557
50	100	$2\cdot 5^{2}\cdot 73$	$2^{2}\cdot 5^{2}\cdot 37$	$2\cdot 3\cdot 5^{4}$	$2^{3}\cdot 5^{2}\cdot 19$	$2\cdot 5^{2}\cdot 7\cdot 11$	$2^{2}\cdot 3\cdot 5^{2}\cdot 13$

From		**3900**	**3950**	**4000**	**4050**	**4100**	**4150**
To		**3950**	**4000**	**4050**	**4100**	**4150**	**4200**
0	50	$2^2\cdot3\cdot5^2\cdot13$	$2\cdot5^2\cdot79$	$2^5\cdot5^3$	$2\cdot3^4\cdot5^2$	$2^2\cdot5^2\cdot41$	$2\cdot5^2\cdot83$
1	51	47·83	$3^2\cdot439$	....	....	3·1367	7·593
2	52	2·1951	$2^4\cdot13\cdot19$	2·3·23·29	$2^2\cdot1013$	2·7·293	$2^3\cdot3\cdot173$
3	53	3·1301	59·67	....	3·7·193	11·373	....
4	54	$2^6\cdot61$	2·3·659	$2^2\cdot7\cdot11\cdot13$	2·2027	$2^3\cdot3^3\cdot19$	2·31·67
5	55	5·11·71	5·7·113	$3^2\cdot5\cdot89$	5·811	5·821	3·5·277
6	56	$2\cdot3^2\cdot7\cdot31$	$2^2\cdot23\cdot43$	2·2003	$2^3\cdot3\cdot13^2$	2·2053	$2^2\cdot1039$
7	57	....	3·1319	....	....	$3\cdot37^2$	....
8	58	$2^2\cdot977$	2·1979	$2^3\cdot3\cdot167$	2·2029	$2^2\cdot13\cdot79$	$2\cdot3^3\cdot7\cdot11$
9	59	3·1303	37·107	19·211	$3^2\cdot11\cdot41$	7·587	....
10	60	2·5·17·23	$2^3\cdot3^2\cdot5\cdot11$	2·5·401	$2^2\cdot5\cdot7\cdot29$	2·3·5·137	$2^6\cdot5\cdot13$
11	61	....	17·233	3·7·191	31·131	....	3·19·73
12	62	$2^3\cdot3\cdot163$	2·7·283	$2^2\cdot17\cdot59$	2·3·677	$2^4\cdot257$	2·2081
13	63	7·13·43	3·1321	....	17·239	$3^2\cdot457$	23·181
14	64	2.19·103	$2^2\cdot991$	$2\cdot3^2\cdot223$	$2^5\cdot127$	$2\cdot11^2\cdot17$	$2^2\cdot3\cdot347$
15	65	$3^3\cdot5\cdot29$	5·13·61	5·11·73	3·5·271	5·823	$5\cdot7^2\cdot17$
16	66	$2^2\cdot11\cdot89$	2·3·661	$2^4\cdot251$	2·19·107	$2^2\cdot3\cdot7^3$	2·2083
17	67	....	....	3·13·103	$7^2\cdot83$	23·179	$3^2\cdot463$
18	68	2·3·653	$2^7\cdot31$	$2\cdot7^2\cdot41$	$2^2\cdot3^2\cdot113$	2·29·71	$2^3\cdot521$
19	69	....	$3^4\cdot7^2$	....	13·313	3·1373	11·379
20	70	$2^4\cdot5\cdot7^2$	2·5·397	$2^2\cdot3\cdot5\cdot67$	2·5·11·37	$2^3\cdot5\cdot103$	2·3·5·139
21	71	3·1307	$11\cdot19^2$	....	3·23·59	13·317	43·97
22	72	2·37·53	$2^2\cdot3\cdot331$	2·2011	$2^3\cdot509$	$2\cdot3^2\cdot229$	$2^2\cdot7\cdot149$
23	73	....	29·137	$3^3\cdot149$	....	7·19·31	3·13·107
24	74	$2^2\cdot3^2\cdot109$	2·1987	$2^3\cdot503$	2·3·7·97	$2^2\cdot1031$	2·2087
25	75	$5^2\cdot157$	$3\cdot5^2\cdot53$	$5^2\cdot7\cdot23$	$5^2\cdot163$	$3\cdot5^3\cdot11$	$5^2\cdot167$
26	76	2·13·151	$2^3\cdot7\cdot71$	2·3·11·61	$2^2\cdot1019$	2·2063	$2^4\cdot3^2\cdot29$
27	77	3·7·11·17	41·97	....	$3^3\cdot151$	....	....
28	78	$2^3\cdot491$	$2\cdot3^2\cdot13\cdot17$	$2^2\cdot19\cdot53$	2·2039	$2^5\cdot3\cdot43$	2·2089
29	79	....	23·173	3·17·79	....	....	3·7·199
30	80	2·3·5·131	$2^2\cdot5\cdot199$	2·5·13·31	$2^4\cdot3\cdot5\cdot17$	2·5·7·59	$2^2\cdot5\cdot11\cdot19$
31	81	....	3·1327	29·139	7·11·53	$3^5\cdot17$	37·113
32	82	$2^2\cdot983$	2·11·181	$2^6\cdot3^2\cdot7$	2·13·157	$2^2\cdot1033$	2·3·17·41
33	83	$3^2\cdot19\cdot23$	7·569	37·109	3·1361	....	47·89
34	84	2·7·281	$2^4\cdot3\cdot83$	2·2017	$2^2\cdot1021$	2·3·13·53	$2^3\cdot523$
35	85	5·787	5·797	3·5·269	5·19·43	5·827	$3^3\cdot5\cdot31$
36	86	$2^5\cdot3\cdot41$	2·1993	$2^2\cdot1009$	$2\cdot3^3\cdot227$	$2^3\cdot11\cdot47$	2·7·13·23
37	87	31·127	$3^2\cdot443$	11·367	61·67	3·7·197	53·79
38	88	2·11·179	$2^2\cdot997$	2·3·673	$2^3\cdot7\cdot73$	2·2069	$2^2\cdot3\cdot349$
39	89	3·13·101	....	7·577	3·29·47	....	59·71
40	90	$2^2\cdot5\cdot197$	2·3·5·7·19	$2^3\cdot5\cdot101$	2·5·409	$2^2\cdot3^2\cdot5\cdot23$	2·5·419
41	91	7·563	13·307	$3^2\cdot449$	....	41·101	3·11·127
42	92	$2\cdot3^3\cdot73$	$2^3\cdot499$	2·43·47	$2^2\cdot3\cdot11\cdot31$	2·19·109	$2^5\cdot131$
43	93	....	$3\cdot11^3$	13·311	....	3·1381	7·599
44	94	$2^3\cdot17\cdot29$	2·1997	$2^2\cdot3\cdot337$	2·23·89	$2^4\cdot7\cdot37$	$2\cdot3^2\cdot233$
45	95	3·5·263	5·17·47	5·809	$3^2\cdot5\cdot7\cdot13$	5·829	5·839
46	96	2·1973	$2^2\cdot3^3\cdot37$	$2\cdot7\cdot17^2$	2^{12}	2·3·691	$2^2\cdot1049$
47	97	....	7·571	3·19·71	17·241	11·13·29	3·1399
48	98	$2^2\cdot3\cdot7\cdot47$	2·1999	$2^4\cdot11\cdot23$	2·3·683	$2^2\cdot17\cdot61$	2·2099
49	99	11·359	3·31·43	....	....	$3^2\cdot461$	13·17·19
50	100	$2\cdot5^2\cdot79$	$2^5\cdot5^3$	$2\cdot3^4\cdot5^2$	$2^2\cdot5^2\cdot41$	$2\cdot5^2\cdot83$	$2^3\cdot3\cdot5^2\cdot7$

From	To	4200 / 4250	4250 / 4300	4300 / 4350	4350 / 4400	4400 / 4450	4450 / 4500
0	50	$2^3\cdot3\cdot5^2\cdot7$	$2\cdot5^3\cdot17$	$2^2\cdot5^2\cdot43$	$2\cdot3\cdot5^2\cdot29$	$2^4\cdot5^2\cdot11$	$2\cdot5^2\cdot89$
1	51	....	$3\cdot13\cdot109$	$11\cdot17\cdot23$	$19\cdot229$	$3^3\cdot163$	....
2	52	$2\cdot11\cdot191$	$2^2\cdot1063$	$2\cdot3^2\cdot239$	$2^8\cdot17$	$2\cdot31\cdot71$	$2^2\cdot3\cdot7\cdot53$
3	53	$3^2\cdot467$	....	$13\cdot331$	$3\cdot1451$	$7\cdot17\cdot37$	$61\cdot73$
4	54	$2^2\cdot1051$	$2\cdot3\cdot709$	$2^4\cdot269$	$2\cdot7\cdot311$	$2^2\cdot3\cdot367$	$2\cdot17\cdot131$
5	55	$5\cdot29^2$	$5\cdot23\cdot37$	$3\cdot5\cdot7\cdot41$	$5\cdot13\cdot67$	$5\cdot881$	$3^4\cdot5\cdot11$
6	56	$2\cdot3\cdot701$	$2^5\cdot7\cdot19$	$2\cdot2153$	$2^2\cdot3^2\cdot11^2$	$2\cdot2203$	$2^3\cdot557$
7	57	$7\cdot601$	$3^2\cdot11\cdot43$	$59\cdot73$	....	$3\cdot13\cdot113$	....
8	58	$2^4\cdot263$	$2\cdot2129$	$2^2\cdot3\cdot359$	$2\cdot2179$	$2^3\cdot19\cdot29$	$2\cdot3\cdot743$
9	59	$3\cdot23\cdot61$	....	$31\cdot139$	$3\cdot1453$	....	$7^3\cdot13$
10	60	$2\cdot5\cdot421$	$2^2\cdot3\cdot5\cdot71$	$2\cdot5\cdot431$	$2^3\cdot5\cdot109$	$2\cdot3^2\cdot5\cdot7^2$	$2^2\cdot5\cdot223$
11	61	....	....	$3^2\cdot479$	$7^2\cdot89$	$11\cdot401$	$3\cdot1487$
12	62	$2^2\cdot3^4\cdot13$	$2\cdot2131$	$2^3\cdot7^2\cdot11$	$2\cdot3\cdot727$	$2^2\cdot1103$	$2\cdot23\cdot97$
13	63	$11\cdot383$	$3\cdot7^2\cdot29$	$19\cdot227$	....	$3\cdot1471$	....
14	64	$2\cdot7^2\cdot43$	$2^3\cdot13\cdot41$	$2\cdot3\cdot719$	$2^2\cdot1091$	$2\cdot2207$	$2^4\cdot3^2\cdot31$
15	65	$3\cdot5\cdot281$	$5\cdot853$	$5\cdot863$	$3^2\cdot5\cdot97$	$5\cdot883$	$5\cdot19\cdot47$
16	66	$2^3\cdot17\cdot31$	$2\cdot3^3\cdot79$	$2^2\cdot13\cdot83$	$2\cdot37\cdot59$	$2^6\cdot3\cdot23$	$2\cdot7\cdot11\cdot29$
17	67	....	$17\cdot251$	$3\cdot1439$	$11\cdot397$	$7\cdot631$	$3\cdot1489$
18	68	$2\cdot3\cdot19\cdot37$	$2^2\cdot11\cdot97$	$2\cdot17\cdot127$	$2^4\cdot3\cdot7\cdot13$	$2\cdot47^2$	$2^2\cdot1117$
19	69	....	$3\cdot1423$	$7\cdot617$	$17\cdot257$	$3^2\cdot491$	$41\cdot109$
20	70	$2^2\cdot5\cdot211$	$2\cdot5\cdot7\cdot61$	$2^5\cdot3^3\cdot5$	$2\cdot5\cdot19\cdot23$	$2^2\cdot5\cdot13\cdot17$	$2\cdot3\cdot5\cdot149$
21	71	$3^2\cdot7\cdot67$	....	$29\cdot149$	$3\cdot31\cdot47$	....	$17\cdot263$
22	72	$2\cdot2111$	$2^4\cdot3\cdot89$	$2\cdot2161$	$2^2\cdot1093$	$2\cdot3\cdot11\cdot67$	$2^3\cdot13\cdot43$
23	73	$41\cdot103$	....	$3\cdot11\cdot131$	....	....	$3^2\cdot7\cdot71$
24	74	$2^7\cdot3\cdot11$	$2\cdot2137$	$2^2\cdot23\cdot47$	$2\cdot3^7$	$2^3\cdot7\cdot79$	$2\cdot2237$
25	75	$5^2\cdot13^2$	$3^2\cdot5^2\cdot19$	$5^2\cdot173$	$5^4\cdot7$	$3\cdot5^2\cdot59$	$5^2\cdot179$
26	76	$2\cdot2113$	$2^2\cdot1069$	$2\cdot3\cdot7\cdot103$	$2^3\cdot547$	$2\cdot2213$	$2^2\cdot3\cdot373$
27	77	$3\cdot1409$	$7\cdot13\cdot47$	....	$3\cdot1459$	$19\cdot233$	$11^2\cdot37$
28	78	$2^2\cdot7\cdot151$	$2\cdot3\cdot23\cdot31$	$2^3\cdot541$	$2\cdot11\cdot199$	$2^2\cdot3^3\cdot41$	$2\cdot2239$
29	79	....	$11\cdot389$	$3^2\cdot13\cdot37$	$29\cdot151$	$43\cdot103$	$3\cdot1493$
30	80	$2\cdot3^2\cdot5\cdot47$	$2^3\cdot5\cdot107$	$2\cdot5\cdot433$	$2^2\cdot3\cdot5\cdot73$	$2\cdot5\cdot443$	$2^7\cdot5\cdot7$
31	81	....	$3\cdot1427$	$61\cdot71$	$13\cdot337$	$3\cdot7\cdot211$	....
32	82	$2^3\cdot23^2$	$2\cdot2141$	$2^2\cdot3\cdot19^2$	$2\cdot7\cdot313$	$2^4\cdot277$	$2\cdot3^3\cdot83$
33	83	$3\cdot17\cdot83$	....	$7\cdot619$	$3^2\cdot487$	$11\cdot13\cdot31$	....
34	84	$2\cdot29\cdot73$	$2^2\cdot3^2\cdot7\cdot17$	$2\cdot11\cdot197$	$2^5\cdot137$	$2\cdot3\cdot739$	$2^2\cdot19\cdot59$
35	85	$5\cdot7\cdot11^2$	$5\cdot857$	$3\cdot5\cdot17^2$	$5\cdot877$	$5\cdot887$	$3\cdot5\cdot13\cdot23$
36	86	$2^2\cdot3\cdot353$	$2\cdot2143$	$2^4\cdot271$	$2\cdot3\cdot17\cdot43$	$2^2\cdot1109$	$2\cdot2243$
37	87	$19\cdot223$	$3\cdot1429$	....	$41\cdot107$	$3^2\cdot17\cdot29$	$7\cdot641$
38	88	$2\cdot13\cdot163$	$2^6\cdot67$	$2\cdot3^2\cdot241$	$2^2\cdot1097$	$2\cdot7\cdot317$	$2^3\cdot3\cdot11\cdot17$
39	89	$3^3\cdot157$	....	....	$3\cdot7\cdot11\cdot19$	$23\cdot193$	67^2
40	90	$2^4\cdot5\cdot53$	$2\cdot3\cdot5\cdot11\cdot13$	$2^2\cdot5\cdot7\cdot31$	$2\cdot5\cdot439$	$2^3\cdot3\cdot5\cdot37$	$2\cdot5\cdot449$
41	91	....	$7\cdot613$	$3\cdot1447$	....	....	$3^2\cdot499$
42	92	$2\cdot3\cdot7\cdot101$	$2^2\cdot29\cdot37$	$2\cdot13\cdot167$	$2^3\cdot3^2\cdot61$	$2\cdot2221$	$2^2\cdot1123$
43	93	....	$3^4\cdot53$	$43\cdot101$	$23\cdot191$	$3\cdot1481$	....
44	94	$2^2\cdot1061$	$2\cdot19\cdot113$	$2^3\cdot3\cdot181$	$2\cdot13^3$	$2^2\cdot11\cdot101$	$2\cdot3\cdot7\cdot107$
45	95	$3\cdot5\cdot283$	$5\cdot859$	$5\cdot11\cdot79$	$3\cdot5\cdot293$	$5\cdot7\cdot127$	$5\cdot29\cdot31$
46	96	$2\cdot11\cdot193$	$2^3\cdot3\cdot179$	$2\cdot41\cdot53$	$2^2\cdot7\cdot151$	$2\cdot3^2\cdot13\cdot19$	$2^4\cdot281$
47	97	$31\cdot137$	....	$3^3\cdot7\cdot23$	....	....	$3\cdot1499$
48	98	$2^3\cdot3^2\cdot59$	$2\cdot7\cdot307$	$2^2\cdot1087$	$2\cdot3\cdot733$	$2^5\cdot139$	$2\cdot13\cdot173$
49	99	$7\cdot607$	$3\cdot1433$	....	$53\cdot83$	$3\cdot1483$	$11\cdot409$
50	100	$2\cdot5^3\cdot17$	$2^2\cdot5^2\cdot43$	$2\cdot3\cdot5^2\cdot29$	$2^4\cdot5^2\cdot11$	$2\cdot5^2\cdot89$	$2^2\cdot3^2\cdot5^3$

From To		4500 4550	4550 4600	4600 4650	4650 4700	4700 4750	4750 4800
0	50	$2^2 \cdot 3^2 \cdot 5^3$	$2 \cdot 5^2 \cdot 7 \cdot 13$	$2^3 \cdot 5^2 \cdot 23$	$2 \cdot 3 \cdot 5^2 \cdot 31$	$2^2 \cdot 5^2 \cdot 47$	$2 \cdot 5^3 \cdot 19$
1	51	$7 \cdot 643$	$3 \cdot 37 \cdot 41$	$43 \cdot 107$	....	$3 \cdot 1567$	....
2	52	$2 \cdot 2251$	$2^3 \cdot 569$	$2 \cdot 3 \cdot 13 \cdot 59$	$2^2 \cdot 1163$	$2 \cdot 2351$	$2^4 \cdot 3^3 \cdot 11$
3	53	$3 \cdot 19 \cdot 79$	$29 \cdot 157$	....	$3^2 \cdot 11 \cdot 47$	....	$7^2 \cdot 97$
4	54	$2^3 \cdot 563$	$2 \cdot 3^2 \cdot 11 \cdot 23$	$2^2 \cdot 1151$	$2 \cdot 13 \cdot 179$	$2^5 \cdot 3 \cdot 7^2$	$2 \cdot 2377$
5	55	$5 \cdot 17 \cdot 53$	$5 \cdot 911$	$3 \cdot 5 \cdot 307$	$5 \cdot 7^2 \cdot 19$	$5 \cdot 941$	$3 \cdot 5 \cdot 317$
6	56	$2 \cdot 3 \cdot 751$	$2^2 \cdot 17 \cdot 67$	$2 \cdot 7^2 \cdot 47$	$2^4 \cdot 3 \cdot 97$	$2 \cdot 13 \cdot 181$	$2^2 \cdot 29 \cdot 41$
7	57	....	$3 \cdot 7^2 \cdot 31$	$17 \cdot 271$	....	$3^2 \cdot 523$	$67 \cdot 71$
8	58	$2^2 \cdot 7^2 \cdot 23$	$2 \cdot 43 \cdot 53$	$2^9 \cdot 3^2$	$2 \cdot 17 \cdot 137$	$2^2 \cdot 11 \cdot 107$	$2 \cdot 3 \cdot 13 \cdot 61$
9	59	$3^3 \cdot 167$	$47 \cdot 97$	$11 \cdot 419$	$3 \cdot 1553$	$17 \cdot 277$	....
10	60	$2 \cdot 5 \cdot 11 \cdot 41$	$2^4 \cdot 3 \cdot 5 \cdot 19$	$2 \cdot 5 \cdot 461$	$2^2 \cdot 5 \cdot 233$	$2 \cdot 3 \cdot 5 \cdot 157$	$2^3 \cdot 5 \cdot 7 \cdot 17$
11	61	$13 \cdot 347$	....	$3 \cdot 29 \cdot 53$	$59 \cdot 79$	$7 \cdot 673$	$3^2 \cdot 23^2$
12	62	$2^5 \cdot 3 \cdot 47$	$2 \cdot 2281$	$2^2 \cdot 1153$	$2 \cdot 3^2 \cdot 7 \cdot 37$	$2^3 \cdot 19 \cdot 31$	$2 \cdot 2381$
13	63	....	$3^3 \cdot 13^2$	$7 \cdot 659$	....	$3 \cdot 1571$	$11 \cdot 433$
14	64	$2 \cdot 37 \cdot 61$	$2^2 \cdot 7 \cdot 163$	$2 \cdot 3 \cdot 769$	$2^3 \cdot 11 \cdot 53$	$2 \cdot 2357$	$2^2 \cdot 3 \cdot 397$
15	65	$3 \cdot 5 \cdot 7 \cdot 43$	$5 \cdot 11 \cdot 83$	$5 \cdot 13 \cdot 71$	$3 \cdot 5 \cdot 311$	$5 \cdot 23 \cdot 41$	$5 \cdot 953$
16	66	$2^2 \cdot 1129$	$2 \cdot 3 \cdot 761$	$2^3 \cdot 577$	$2 \cdot 2333$	$2^2 \cdot 3^2 \cdot 131$	$2 \cdot 2383$
17	67	....	....	$3^5 \cdot 19$	$13 \cdot 359$	$53 \cdot 89$	$3 \cdot 7 \cdot 227$
18	68	$2 \cdot 3^2 \cdot 251$	$2^3 \cdot 571$	$2 \cdot 2309$	$2^2 \cdot 3 \cdot 389$	$2 \cdot 7 \cdot 337$	$2^5 \cdot 149$
19	69	....	$3 \cdot 1523$	$31 \cdot 149$	$7 \cdot 23 \cdot 29$	$3 \cdot 11^2 \cdot 13$	$19 \cdot 251$
20	70	$2^3 \cdot 5 \cdot 113$	$2 \cdot 5 \cdot 457$	$2^2 \cdot 3 \cdot 5 \cdot 7 \cdot 11$	$2 \cdot 5 \cdot 467$	$2^4 \cdot 5 \cdot 59$	$2 \cdot 3^2 \cdot 5 \cdot 53$
21	71	$3 \cdot 11 \cdot 137$	$7 \cdot 653$	....	$3^3 \cdot 173$	....	$13 \cdot 367$
22	72	$2 \cdot 7 \cdot 17 \cdot 19$	$2^2 \cdot 3^2 \cdot 127$	$2 \cdot 2311$	$2^6 \cdot 73$	$2 \cdot 3 \cdot 787$	$2^2 \cdot 1193$
23	73	....	$17 \cdot 269$	$3 \cdot 23 \cdot 67$	....	....	$3 \cdot 37 \cdot 43$
24	74	$2^2 \cdot 3 \cdot 13 \cdot 29$	$2 \cdot 2287$	$2^4 \cdot 17^2$	$2 \cdot 3 \cdot 19 \cdot 41$	$2^2 \cdot 1181$	$2 \cdot 7 \cdot 11 \cdot 31$
25	75	$5^2 \cdot 181$	$3 \cdot 5^2 \cdot 61$	$5^3 \cdot 37$	$5^2 \cdot 11 \cdot 17$	$3^3 \cdot 5^2 \cdot 7$	$5^2 \cdot 191$
26	76	$2 \cdot 31 \cdot 73$	$2^5 \cdot 11 \cdot 13$	$2 \cdot 3^2 \cdot 257$	$2^2 \cdot 7 \cdot 167$	$2 \cdot 17 \cdot 139$	$2^3 \cdot 3 \cdot 199$
27	77	$3^2 \cdot 503$	$23 \cdot 199$	$7 \cdot 661$	$3 \cdot 1559$	$29 \cdot 163$	$17 \cdot 281$
28	78	$2^4 \cdot 283$	$2 \cdot 3 \cdot 7 \cdot 109$	$2^2 \cdot 13 \cdot 89$	$2 \cdot 2339$	$2^3 \cdot 3 \cdot 197$	$2 \cdot 2389$
29	79	$7 \cdot 647$	$19 \cdot 241$	$3 \cdot 1543$	....	....	$3^4 \cdot 59$
30	80	$2 \cdot 3 \cdot 5 \cdot 151$	$2^2 \cdot 5 \cdot 229$	$2 \cdot 5 \cdot 463$	$2^3 \cdot 3^2 \cdot 5 \cdot 13$	$2 \cdot 5 \cdot 11 \cdot 43$	$2^2 \cdot 5 \cdot 239$
31	81	$23 \cdot 197$	$3^2 \cdot 509$	$11 \cdot 421$	$31 \cdot 151$	$3 \cdot 19 \cdot 83$	$7 \cdot 683$
32	82	$2^2 \cdot 11 \cdot 103$	$2 \cdot 29 \cdot 79$	$2^3 \cdot 3 \cdot 193$	$2 \cdot 2341$	$2^2 \cdot 7 \cdot 13^2$	$2 \cdot 3 \cdot 797$
33	83	$3 \cdot 1511$	....	$41 \cdot 113$	$3 \cdot 7 \cdot 223$	....	....
34	84	$2 \cdot 2267$	$2^3 \cdot 3 \cdot 191$	$2 \cdot 7 \cdot 331$	$2^2 \cdot 1171$	$2 \cdot 3^2 \cdot 263$	$2^4 \cdot 13 \cdot 23$
35	85	$5 \cdot 907$	$5 \cdot 7 \cdot 131$	$3^2 \cdot 5 \cdot 103$	$5 \cdot 937$	$5 \cdot 947$	$3 \cdot 5 \cdot 11 \cdot 29$
36	86	$2^3 \cdot 3^4 \cdot 7$	$2 \cdot 2293$	$2^2 \cdot 19 \cdot 61$	$2 \cdot 3 \cdot 11 \cdot 71$	$2^7 \cdot 37$	$2 \cdot 2393$
37	87	$13 \cdot 349$	$3 \cdot 11 \cdot 139$	....	$43 \cdot 109$	$3 \cdot 1579$	....
38	88	$2 \cdot 2269$	$2^2 \cdot 31 \cdot 37$	$2 \cdot 3 \cdot 773$	$2^4 \cdot 293$	$2 \cdot 23 \cdot 103$	$2^2 \cdot 3^2 \cdot 7 \cdot 19$
39	89	$3 \cdot 17 \cdot 89$	$13 \cdot 353$	....	$3^2 \cdot 521$	$7 \cdot 677$	....
40	90	$2^2 \cdot 5 \cdot 227$	$2 \cdot 3^3 \cdot 5 \cdot 17$	$2^5 \cdot 5 \cdot 29$	$2 \cdot 5 \cdot 7 \cdot 67$	$2^2 \cdot 3 \cdot 5 \cdot 79$	$2 \cdot 5 \cdot 479$
41	91	$19 \cdot 239$	....	$3 \cdot 7 \cdot 13 \cdot 17$	....	$11 \cdot 431$	$3 \cdot 1597$
42	92	$2 \cdot 3 \cdot 757$	$2^4 \cdot 7 \cdot 41$	$2 \cdot 11 \cdot 211$	$2^2 \cdot 3 \cdot 17 \cdot 23$	$2 \cdot 2371$	$2^3 \cdot 599$
43	93	$7 \cdot 11 \cdot 59$	$3 \cdot 1531$	....	$13 \cdot 19^2$	$3^2 \cdot 17 \cdot 31$	....
44	94	$2^6 \cdot 71$	$2 \cdot 2297$	$2^2 \cdot 3^3 \cdot 43$	$2 \cdot 2347$	$2^3 \cdot 593$	$2 \cdot 3 \cdot 17 \cdot 47$
45	95	$3^2 \cdot 5 \cdot 101$	$5 \cdot 919$	$5 \cdot 929$	$3 \cdot 5 \cdot 313$	$5 \cdot 13 \cdot 73$	$5 \cdot 7 \cdot 137$
46	96	$2 \cdot 2273$	$2^2 \cdot 3 \cdot 383$	$2 \cdot 23 \cdot 101$	$2^3 \cdot 587$	$2 \cdot 3 \cdot 7 \cdot 113$	$2^2 \cdot 11 \cdot 109$
47	97	....	....	$3 \cdot 1549$	$7 \cdot 11 \cdot 61$	$47 \cdot 101$	$3^2 \cdot 13 \cdot 41$
48	98	$2^2 \cdot 3 \cdot 379$	$2 \cdot 11^2 \cdot 19$	$2^3 \cdot 7 \cdot 83$	$2 \cdot 3^4 \cdot 29$	$2^2 \cdot 1187$	$2 \cdot 2399$
49	99	....	$3^2 \cdot 7 \cdot 73$	....	$37 \cdot 127$	$3 \cdot 1583$	....
50	100	$2 \cdot 5^2 \cdot 7 \cdot 13$	$2^3 \cdot 5^2 \cdot 23$	$2 \cdot 3 \cdot 5^2 \cdot 31$	$2^2 \cdot 5^2 \cdot 47$	$2 \cdot 5^3 \cdot 19$	$2^6 \cdot 3 \cdot 5^2$

From		4800	4850	4900	4950	5000	5050
To		4850	4900	4950	5000	5050	5100
0	50	$2^6 \cdot 3 \cdot 5^2$	$2 \cdot 5^2 \cdot 97$	$2^2 \cdot 5^2 \cdot 7^2$	$2 \cdot 3^2 \cdot 5^2 \cdot 11$	$2^3 \cdot 5^4$	$2 \cdot 5^2 \cdot 101$
1	51	....	$3^2 \cdot 7^2 \cdot 11$	$13^2 \cdot 29$	....	3·1667	....
2	52	$2 \cdot 7^4$	$2^2 \cdot 1213$	2·3·19·43	$2^3 \cdot 619$	2·41·61	$2^2 \cdot 3 \cdot 421$
3	53	3·1601	23·211	....	3·13·127	....	31·163
4	54	$2^2 \cdot 1201$	2·3·809	$2^3 \cdot 613$	2·2477	$2^2 \cdot 3^2 \cdot 139$	$2 \cdot 7 \cdot 19^2$
5	55	$5 \cdot 31^2$	5·971	$3^2 \cdot 5 \cdot 109$	5·991	5·7·11·13	3·5·337
6	56	$2 \cdot 3^3 \cdot 89$	$2^3 \cdot 607$	2·11·223	$2^2 \cdot 3 \cdot 7 \cdot 59$	2·2503	$2^6 \cdot 79$
7	57	11·19·23	3·1619	7·701	....	3·1669	13·389
8	58	$2^3 \cdot 601$	2·7·347	$2^2 \cdot 3 \cdot 409$	2·37·67	$2^4 \cdot 313$	$2 \cdot 3^2 \cdot 281$
9	59	3·7·229	43·113	....	$3^2 \cdot 19 \cdot 29$	....	....
10	60	2·5·13·37	$2^2 \cdot 3^5 \cdot 5$	2·5·491	$2^5 \cdot 5 \cdot 31$	2·3·5·167	$2^2 \cdot 5 \cdot 11 \cdot 23$
11	61	17·283	....	3·1637	$11^2 \cdot 41$	....	3·7·241
12	62	$2^2 \cdot 3 \cdot 401$	2·11·13·17	$2^4 \cdot 307$	2·3·827	$2^2 \cdot 7 \cdot 179$	2·2531
13	63	....	3·1621	17^3	7·709	$3^2 \cdot 557$	61·83
14	64	2·29·83	$2^8 \cdot 19$	$2 \cdot 3^3 \cdot 7 \cdot 13$	$2^2 \cdot 17 \cdot 73$	2·23·109	$2^3 \cdot 3 \cdot 211$
15	65	$3^2 \cdot 5 \cdot 107$	5·7·139	5·983	3·5·331	5·17·59	5·1013
16	66	$2^4 \cdot 7 \cdot 43$	2·3·811	$2^2 \cdot 1229$	2·13·191	$2^3 \cdot 3 \cdot 11 \cdot 19$	2·17·149
17	67	....	31·157	3·11·149	....	29·173	$3^2 \cdot 563$
18	68	2·3·11·73	$2^2 \cdot 1217$	2·2459	$2^3 \cdot 3^3 \cdot 23$	2·13·193	$2^2 \cdot 7 \cdot 181$
19	69	61·79	$3^2 \cdot 541$	....	....	3·7·239	37·137
20	70	$2^2 \cdot 5 \cdot 241$	2·5·487	$2^3 \cdot 3 \cdot 5 \cdot 41$	2·5·7·71	$2^2 \cdot 5 \cdot 251$	$2 \cdot 3 \cdot 5 \cdot 13^2$
21	71	3·1607	....	7·19·37	3·1657	....	11·461
22	72	2·2411	$2^3 \cdot 3 \cdot 7 \cdot 29$	2·23·107	$2^2 \cdot 11 \cdot 113$	$2 \cdot 3^4 \cdot 31$	$2^4 \cdot 317$
23	73	7·13·53	11·443	$3^2 \cdot 547$	....	....	3·19·89
24	74	$2^3 \cdot 3^2 \cdot 67$	2·2437	$2^2 \cdot 1231$	2·3·829	$2^5 \cdot 157$	2·43·59
25	75	$5^2 \cdot 193$	$3 \cdot 5^3 \cdot 13$	$5^2 \cdot 197$	$5^2 \cdot 199$	$3 \cdot 5^2 \cdot 67$	$5^2 \cdot 7 \cdot 29$
26	76	2·19·127	$2^2 \cdot 23 \cdot 53$	2·3·821	$2^4 \cdot 311$	2·7·359	$2^2 \cdot 3^3 \cdot 47$
27	77	3·1609	....	13·379	$3^2 \cdot 7 \cdot 79$	11·457	....
28	78	$2^2 \cdot 17 \cdot 71$	$2 \cdot 3^2 \cdot 271$	$2^6 \cdot 7 \cdot 11$	2·19·131	$2^2 \cdot 3 \cdot 419$	2·2539
29	79	11·439	7·17·41	3·31·53	13·383	47·107	3·1693
30	80	2·3·5·7·23	$2^4 \cdot 5 \cdot 61$	2·5·17·29	$2^2 \cdot 3 \cdot 5 \cdot 83$	2·5·503	$2^3 \cdot 5 \cdot 127$
31	81	....	3·1627	....	17·293	$3^2 \cdot 13 \cdot 43$	....
32	82	$2^5 \cdot 151$	2·2441	$2^2 \cdot 3^2 \cdot 137$	2·47·53	$2^3 \cdot 17 \cdot 37$	$2 \cdot 3 \cdot 7 \cdot 11^2$
33	83	$3^3 \cdot 179$	19·257	....	3·11·151	7·719	13·17·23
34	84	2·2417	$2^2 \cdot 3 \cdot 11 \cdot 37$	2·2467	$2^3 \cdot 7 \cdot 89$	2·3·839	$2^2 \cdot 31 \cdot 41$
35	85	5·967	5·977	3·5·7·47	5·997	5·19·53	$3^2 \cdot 5 \cdot 113$
36	86	$2^2 \cdot 3 \cdot 13 \cdot 31$	2·7·349	$2^3 \cdot 617$	$2 \cdot 3^2 \cdot 277$	$2^2 \cdot 1259$	2·2543
37	87	7·691	$3^3 \cdot 181$	....	....	3·23·73	....
38	88	2·41·59	$2^3 \cdot 13 \cdot 47$	2·3·823	$2^2 \cdot 29 \cdot 43$	2·11·229	$2^5 \cdot 3 \cdot 53$
39	89	3·1613	....	11·449	3·1663	....	7·727
40	90	$2^3 \cdot 5 \cdot 11^2$	2·3·5·163	$2^2 \cdot 5 \cdot 13 \cdot 19$	2·5·499	$2^4 \cdot 3^2 \cdot 5 \cdot 7$	2·5·509
41	91	47·103	67·73	$3^4 \cdot 61$	7·23·31	71^2	3·1697
42	92	$2 \cdot 3^2 \cdot 269$	$2^2 \cdot 1223$	2·7·353	$2^7 \cdot 3 \cdot 13$	2·2521	$2^2 \cdot 19 \cdot 67$
43	93	29·167	3·7·233	....	....	$3 \cdot 41^2$	11·463
44	94	$2^2 \cdot 7 \cdot 173$	2·2447	$2^4 \cdot 3 \cdot 103$	2·11·227	$2^2 \cdot 13 \cdot 97$	$2 \cdot 3^2 \cdot 283$
45	95	3·5·17·19	5·11·89	5·23·43	$3^3 \cdot 5 \cdot 37$	5·1009	5·1019
46	96	2·2423	$2^5 \cdot 3^2 \cdot 17$	2·2473	$2^2 \cdot 1249$	$2 \cdot 3 \cdot 29^2$	$2^3 \cdot 7^2 \cdot 13$
47	97	37·131	59·83	3·17·97	19·263	$7^2 \cdot 103$	3·1699
48	98	$2^4 \cdot 3 \cdot 101$	2·31·79	$2^2 \cdot 1237$	$2 \cdot 3 \cdot 7^2 \cdot 17$	$2^3 \cdot 631$	2·2549
49	99	13·373	3·23·71	$7^2 \cdot 101$	....	$3^3 \cdot 21 \cdot 17$	....
50	100	$2 \cdot 5^2 \cdot 97$	$2^2 \cdot 5^2 \cdot 7^2$	$2 \cdot 3^2 \cdot 5^2 \cdot 11$	$2^3 \cdot 5^4$	$2 \cdot 5^2 \cdot 101$	$2^2 \cdot 3 \cdot 5^2 \cdot 17$

From		5100	5150	5200	5250	5300	5350
To		5150	5200	5250	5300	5350	5400
0	50	$2^2\cdot3\cdot5^2\cdot17$	$2\cdot5^2\cdot103$	$2^4\cdot5^2\cdot13$	$2\cdot3\cdot5^3\cdot7$	$2^2\cdot5^2\cdot53$	$2\cdot5^2\cdot107$
1	51	....	3·17·101	7·743	59·89	$3^2\cdot19\cdot31$	....
2	52	2·2551	$2^5\cdot7\cdot23$	$2\cdot3^2\cdot17^2$	$2^2\cdot13\cdot101$	2·11·241	$2^3\cdot3\cdot223$
3	53	$3^6\cdot7$	....	$11^2\cdot43$	3·17·103	....	53·101
4	54	$2^4\cdot11\cdot29$	2·3·859	$2^2\cdot1301$	2·37·71	$2^3\cdot3\cdot13\cdot17$	2·2677
5	55	5·1021	5·1031	3·5·347	5·1051	5·1061	$3^2\cdot5\cdot7\cdot17$
6	56	2·3·23·37	$2^2\cdot1289$	2·19·137	$2^3\cdot3^2\cdot73$	2·7·379	$2^2\cdot13\cdot103$
7	57	....	$3^3\cdot191$	41·127	7·751	3·29·61	11·487
8	58	$2^2\cdot1277$	2·2579	$2^3\cdot3\cdot7\cdot31$	2·11·239	$2^2\cdot1327$	2·3·19·47
9	59	3·13·131	7·11·67	....	3·1753	....	23·233
10	60	2·5·7·73	$2^3\cdot3\cdot5\cdot43$	2·5·521	$2^2\cdot5\cdot263$	$2\cdot3^2\cdot5\cdot59$	$2^4\cdot5\cdot67$
11	61	19·269	13·397	$3^3\cdot193$	....	47·113	3·1787
12	62	$2^3\cdot3^2\cdot71$	2·29·89	$2^2\cdot1303$	2·3·877	$2^6\cdot83$	2·7·383
13	63	....	3·1721	13·401	19·277	3·7·11·23	31·173
14	64	2·2557	$2^2\cdot1291$	2·3·11·79	$2^4\cdot7\cdot47$	2·2657	$2^2\cdot3^2\cdot149$
15	65	3·5·11·31	5·1033	5·7·149	$3^4\cdot5\cdot13$	5·1063	5·29·37
16	66	$2^2\cdot1279$	$2\cdot3^2\cdot7\cdot41$	$2^5\cdot163$	2·2633	$2^2\cdot3\cdot443$	2·2683
17	67	7·17·43	....	3·37·47	23·229	13·409	3·1789
18	68	2·3·853	$2^4\cdot17\cdot19$	2·2609	$2^2\cdot3\cdot439$	2·2659	$2^3\cdot11\cdot61$
19	69	....	3·1723	17·307	11·479	$3^3\cdot197$	7·13·59
20	70	$2^{10}\cdot5$	2·5·11·47	$2^2\cdot3^2\cdot5\cdot29$	2·5·17·31	$2^3\cdot5\cdot7\cdot19$	2·3·5·179
21	71	$3^2\cdot569$	....	23·227	3·7·251	17·313	41·131
22	72	2·13·197	$2^2\cdot3\cdot431$	2·7·373	$2^3\cdot659$	2·3·887	$2^2\cdot17\cdot79$
23	73	47·109	7·739	3·1741	....	....	$3^3\cdot199$
24	74	$2^2\cdot3\cdot7\cdot61$	2·13·199	$2^3\cdot653$	$2\cdot3^2\cdot293$	$2^2\cdot11^3$	2·2687
25	75	$5^3\cdot41$	$3^2\cdot5^2\cdot23$	$5^2\cdot11\cdot19$	$5^2\cdot211$	$3\cdot5^2\cdot71$	$5^3\cdot43$
26	76	2·11·233	$2^3\cdot647$	2·3·13·67	$2^2\cdot1319$	2·2663	$2^8\cdot3\cdot7$
27	77	3·1709	31·167	....	3·1759	7·761	19·283
28	78	$2^3\cdot641$	2·3·863	$2^2\cdot1307$	2·7·13·29	$2^4\cdot3^2\cdot37$	2·2689
29	79	23·223	....	$3^2\cdot7\cdot83$	....	73^2	3·11·163
30	80	$2\cdot3^3\cdot5\cdot19$	$2^2\cdot5\cdot7\cdot37$	2·5·523	$2^5\cdot3\cdot5\cdot11$	2·5·13·41	$2^2\cdot5\cdot269$
31	81	7·733	3·11·157	....	....	3·1777	....
32	82	$2^2\cdot1283$	2·2591	$2^4\cdot3\cdot109$	2·19·139	$2^2\cdot31\cdot43$	$2\cdot3^2\cdot13\cdot23$
33	83	3·29·59	71·73	....	$3^2\cdot587$	....	7·769
34	84	2·17·151	$2^6\cdot3^4$	2·2617	$2^2\cdot1321$	2·3·7·127	$2^3\cdot673$
35	85	5·13·79	5·17·61	3·5·349	5·7·151	5·11·97	3·5·359
36	86	$2^4\cdot3\cdot107$	2·2593	$2^2\cdot7\cdot11\cdot17$	2·3·881	$2^3\cdot23\cdot29$	2·2693
37	87	11·467	3·7·13·19	....	17·311	$3^2\cdot593$	....
38	88	2·7·367	$2^2\cdot1297$	$2\cdot3^3\cdot97$	$2^3\cdot661$	2·17·157	$2^2\cdot3\cdot449$
39	89	$3^2\cdot571$	....	$13^2\cdot31$	3·41·43	19·281	17·317
40	90	$2^2\cdot5\cdot257$	2·3·5·173	$2^3\cdot5\cdot131$	$2\cdot5\cdot23^2$	$2^2\cdot3\cdot5\cdot89$	$2\cdot5\cdot7^2\cdot11$
41	91	53·97	29·179	3·1747	11·13·37	$7^2\cdot109$	$3^2\cdot599$
42	92	2·3·857	$2^3\cdot11\cdot59$	2·2621	$2^2\cdot3^3\cdot7^2$	2·2671	$2^4\cdot337$
43	93	37·139	$3^2\cdot577$	$7^2\cdot107$	67·79	3·13·137	....
44	94	$2^3\cdot643$	$2\cdot7^2\cdot53$	$2^2\cdot3\cdot19\cdot23$	2·2647	$2^5\cdot167$	2·3·29·31
45	95	$3\cdot5\cdot7^3$	5·1039	5·1049	3·5·353	5·1069	5·13·83
46	96	2·31·83	$2^2\cdot3\cdot433$	2·43·61	$2^4\cdot331$	$2\cdot3^5\cdot11$	$2^2\cdot19\cdot71$
47	97	....	....	$3^2\cdot11\cdot53$	....	....	3·7·257
48	98	$2^2\cdot3^2\cdot11\cdot13$	2·23·113	$2^7\cdot41$	2·3·883	$2^2\cdot7\cdot191$	2·2699
49	99	19·271	3·1733	29·181	7·757	3·1783	....
50	100	$2\cdot5^2\cdot103$	$2^4\cdot5^2\cdot13$	$2\cdot3\cdot5^3\cdot7$	$2^2\cdot5^2\cdot53$	$2\cdot5^2\cdot107$	$2^3\cdot3^3\cdot5^2$

From To		5400 5450	5450 5500	5500 5550	5550 5600	5600 5650	5650 5700
0	50	$2^3 \cdot 3^3 \cdot 5^2$	$2 \cdot 5^2 \cdot 109$	$2^2 \cdot 5^3 \cdot 11$	$2 \cdot 3 \cdot 5^2 \cdot 37$	$2^5 \cdot 5^2 \cdot 7$	$2 \cdot 5^2 \cdot 113$
1	51	$11 \cdot 491$	$3 \cdot 23 \cdot 79$	....	$7 \cdot 13 \cdot 61$	$3 \cdot 1867$	....
2	52	$2 \cdot 37 \cdot 73$	$2^2 \cdot 29 \cdot 47$	$2 \cdot 3 \cdot 7 \cdot 131$	$2^4 \cdot 347$	$2 \cdot 2801$	$2^2 \cdot 3^2 \cdot 157$
3	53	$3 \cdot 1801$	$7 \cdot 19 \cdot 41$	....	$3^2 \cdot 617$	$13 \cdot 431$	....
4	54	$2^2 \cdot 7 \cdot 193$	$2 \cdot 3^3 \cdot 101$	$2^7 \cdot 43$	$2 \cdot 2777$	$2^2 \cdot 3 \cdot 467$	$2 \cdot 11 \cdot 257$
5	55	$5 \cdot 23 \cdot 47$	$5 \cdot 1091$	$3 \cdot 5 \cdot 367$	$5 \cdot 11 \cdot 101$	$5 \cdot 19 \cdot 59$	$3 \cdot 5 \cdot 13 \cdot 29$
6	56	$2 \cdot 3 \cdot 17 \cdot 53$	$2^4 \cdot 11 \cdot 31$	$2 \cdot 2753$	$2^2 \cdot 3 \cdot 463$	$2 \cdot 2803$	$2^3 \cdot 7 \cdot 101$
7	57	....	$3 \cdot 17 \cdot 107$	....	....	$3^2 \cdot 7 \cdot 89$	....
8	58	$2^5 \cdot 13^2$	$2 \cdot 2729$	$2^2 \cdot 3^4 \cdot 17$	$2 \cdot 7 \cdot 397$	$2^3 \cdot 701$	$2 \cdot 3 \cdot 23 \cdot 41$
9	59	$3^2 \cdot 601$	$53 \cdot 103$	$7 \cdot 787$	$3 \cdot 17 \cdot 109$	$71 \cdot 79$	....
10	60	$2 \cdot 5 \cdot 541$	$2^2 \cdot 3 \cdot 5 \cdot 7 \cdot 13$	$2 \cdot 5 \cdot 19 \cdot 29$	$2^3 \cdot 5 \cdot 139$	$2 \cdot 3 \cdot 5 \cdot 11 \cdot 17$	$2^2 \cdot 5 \cdot 283$
11	61	$7 \cdot 773$	$43 \cdot 127$	$3 \cdot 11 \cdot 167$	$67 \cdot 83$	$31 \cdot 181$	$3^2 \cdot 17 \cdot 37$
12	62	$2^2 \cdot 3 \cdot 11 \cdot 41$	$2 \cdot 2731$	$2^3 \cdot 13 \cdot 53$	$2 \cdot 3^3 \cdot 103$	$2^2 \cdot 23 \cdot 61$	$2 \cdot 19 \cdot 149$
13	63	....	$3^2 \cdot 607$	$37 \cdot 149$	....	$3 \cdot 1871$	$7 \cdot 809$
14	64	$2 \cdot 2707$	$2^3 \cdot 683$	$2 \cdot 3 \cdot 919$	$2^2 \cdot 13 \cdot 107$	$2 \cdot 7 \cdot 401$	$2^5 \cdot 3 \cdot 59$
15	65	$3 \cdot 5 \cdot 19^2$	$5 \cdot 1093$	$5 \cdot 1103$	$3 \cdot 5 \cdot 7 \cdot 53$	$5 \cdot 1123$	$5 \cdot 11 \cdot 103$
16	66	$2^3 \cdot 677$	$2 \cdot 3 \cdot 911$	$2^2 \cdot 7 \cdot 197$	$2 \cdot 11^2 \cdot 23$	$2^4 \cdot 3^3 \cdot 13$	$2 \cdot 2833$
17	67	....	$7 \cdot 11 \cdot 71$	$3^2 \cdot 613$	$19 \cdot 293$	$41 \cdot 137$	$3 \cdot 1889$
18	68	$2 \cdot 3^2 \cdot 7 \cdot 43$	$2^2 \cdot 1367$	$2 \cdot 31 \cdot 89$	$2^6 \cdot 3 \cdot 29$	$2 \cdot 53^2$	$2^2 \cdot 13 \cdot 109$
19	69	....	$3 \cdot 1823$	....	....	$3 \cdot 1873$	....
20	70	$2^2 \cdot 5 \cdot 271$	$2 \cdot 5 \cdot 547$	$2^4 \cdot 3 \cdot 5 \cdot 23$	$2 \cdot 5 \cdot 557$	$2^2 \cdot 5 \cdot 281$	$2 \cdot 3^4 \cdot 5 \cdot 7$
21	71	$3 \cdot 13 \cdot 139$	....	....	$3^2 \cdot 619$	$7 \cdot 11 \cdot 73$	$53 \cdot 107$
22	72	$2 \cdot 2711$	$2^5 \cdot 3^2 \cdot 19$	$2 \cdot 11 \cdot 251$	$2^2 \cdot 7 \cdot 199$	$2 \cdot 3 \cdot 937$	$2^3 \cdot 709$
23	73	$11 \cdot 17 \cdot 29$	$13 \cdot 421$	$3 \cdot 7 \cdot 263$	....	....	$3 \cdot 31 \cdot 61$
24	74	$2^4 \cdot 3 \cdot 113$	$2 \cdot 7 \cdot 17 \cdot 23$	$2^2 \cdot 1381$	$2 \cdot 3 \cdot 929$	$2^3 \cdot 19 \cdot 37$	$2 \cdot 2837$
25	75	$5^2 \cdot 7 \cdot 31$	$3 \cdot 5^2 \cdot 73$	$5^2 \cdot 13 \cdot 17$	$5^2 \cdot 223$	$3^2 \cdot 5^4$	$5^2 \cdot 227$
26	76	$2 \cdot 2713$	$2^2 \cdot 37^2$	$2 \cdot 3^2 \cdot 307$	$2^3 \cdot 17 \cdot 41$	$2 \cdot 29 \cdot 97$	$2^2 \cdot 3 \cdot 11 \cdot 43$
27	77	$3^4 \cdot 67$	....	....	$3 \cdot 11 \cdot 13^2$	$17 \cdot 331$	$7 \cdot 811$
28	78	$2^2 \cdot 23 \cdot 59$	$2 \cdot 3 \cdot 11 \cdot 83$	$2^3 \cdot 691$	$2 \cdot 2789$	$2^2 \cdot 3 \cdot 7 \cdot 67$	$2 \cdot 17 \cdot 167$
29	79	$61 \cdot 89$	....	$3 \cdot 19 \cdot 97$	$7 \cdot 797$	$13 \cdot 433$	$3^2 \cdot 631$
30	80	$2 \cdot 3 \cdot 5 \cdot 181$	$2^3 \cdot 5 \cdot 137$	$2 \cdot 5 \cdot 7 \cdot 79$	$2^2 \cdot 3^2 \cdot 5 \cdot 31$	$2 \cdot 5 \cdot 563$	$2^4 \cdot 5 \cdot 71$
31	81	....	$3^3 \cdot 7 \cdot 29$	....	....	$3 \cdot 1877$	$13 \cdot 19 \cdot 23$
32	82	$2^3 \cdot 7 \cdot 97$	$2 \cdot 2741$	$2^2 \cdot 3 \cdot 461$	$2 \cdot 2791$	$2^9 \cdot 11$	$2 \cdot 3 \cdot 947$
33	83	$3 \cdot 1811$	....	$11 \cdot 503$	$3 \cdot 1861$	$43 \cdot 131$	....
34	84	$2 \cdot 11 \cdot 13 \cdot 19$	$2^2 \cdot 3 \cdot 457$	$2 \cdot 2767$	$2^4 \cdot 349$	$2 \cdot 3^2 \cdot 313$	$2^2 \cdot 7^2 \cdot 29$
35	85	$5 \cdot 1087$	$5 \cdot 1097$	$3^3 \cdot 5 \cdot 41$	$5 \cdot 1117$	$5 \cdot 7^2 \cdot 23$	$3 \cdot 5 \cdot 379$
36	86	$2^2 \cdot 3^2 \cdot 151$	$2 \cdot 13 \cdot 211$	$2^5 \cdot 173$	$2 \cdot 3 \cdot 7^2 \cdot 19$	$2^2 \cdot 1409$	$2 \cdot 2843$
37	87	....	$3 \cdot 31 \cdot 59$	$7^2 \cdot 113$	$37 \cdot 151$	$3 \cdot 1879$	$11^2 \cdot 47$
38	88	$2 \cdot 2719$	$2^4 \cdot 7^3$	$2 \cdot 3 \cdot 13 \cdot 71$	$2^2 \cdot 11 \cdot 127$	$2 \cdot 2819$	$2^3 \cdot 3^2 \cdot 79$
39	89	$3 \cdot 7^2 \cdot 37$	$11 \cdot 499$	$29 \cdot 191$	$3^5 \cdot 23$	....	....
40	90	$2^6 \cdot 5 \cdot 17$	$2 \cdot 3^2 \cdot 5 \cdot 61$	$2^2 \cdot 5 \cdot 277$	$2 \cdot 5 \cdot 13 \cdot 43$	$2^3 \cdot 3 \cdot 5 \cdot 47$	$2 \cdot 5 \cdot 569$
41	91	....	$17^2 \cdot 19$	$3 \cdot 1847$	....	....	$3 \cdot 7 \cdot 271$
42	92	$2 \cdot 3 \cdot 907$	$2^2 \cdot 1373$	$2 \cdot 17 \cdot 163$	$2^3 \cdot 3 \cdot 233$	$2 \cdot 7 \cdot 13 \cdot 31$	$2^2 \cdot 1423$
43	93	....	$3 \cdot 1831$	$23 \cdot 241$	$7 \cdot 17 \cdot 47$	$3^3 \cdot 11 \cdot 19$	....
44	94	$2^2 \cdot 1361$	$2 \cdot 41 \cdot 67$	$2^3 \cdot 3^2 \cdot 7 \cdot 11$	$2 \cdot 2797$	$2^2 \cdot 17 \cdot 83$	$2 \cdot 3 \cdot 13 \cdot 73$
45	95	$3^2 \cdot 5 \cdot 11^2$	$5 \cdot 7 \cdot 157$	$5 \cdot 1109$	$3 \cdot 5 \cdot 373$	$5 \cdot 1129$	$5 \cdot 17 \cdot 67$
46	96	$2 \cdot 7 \cdot 389$	$2^3 \cdot 3 \cdot 229$	$2 \cdot 47 \cdot 59$	$2^2 \cdot 1399$	$2 \cdot 3 \cdot 941$	$2^6 \cdot 89$
47	97	$13 \cdot 419$	$23 \cdot 239$	$3 \cdot 43^2$	$29 \cdot 193$	....	$3^3 \cdot 211$
48	98	$2^3 \cdot 3 \cdot 227$	$2 \cdot 2749$	$2^2 \cdot 19 \cdot 73$	$2 \cdot 3^2 \cdot 311$	$2^4 \cdot 353$	$2 \cdot 7 \cdot 11 \cdot 37$
49	99	....	$3^2 \cdot 13 \cdot 47$	$31 \cdot 179$	$11 \cdot 509$	$3 \cdot 7 \cdot 269$	$41 \cdot 139$
50	100	$2 \cdot 5^2 \cdot 109$	$2^2 \cdot 5^3 \cdot 11$	$2 \cdot 3 \cdot 5^2 \cdot 37$	$2^5 \cdot 5^2 \cdot 7$	$2 \cdot 5^2 \cdot 113$	$2^2 \cdot 3 \cdot 5^2 \cdot 19$

From		5700	5750	5800	5850	5900	5950
To		5750	5800	5850	5900	5950	6000
0	50	$2^2\cdot3\cdot5^2\cdot19$	$2\cdot5^3\cdot23$	$2^3\cdot5^2\cdot29$	$2\cdot3^2\cdot5^2\cdot13$	$2^2\cdot5^2\cdot59$	$2\cdot5^2\cdot7\cdot17$
1	51	....	$3^4\cdot71$	....	....	3·7·281	11·541
2	52	2·2851	$2^3\cdot719$	2·3·967	$2^2\cdot7\cdot11\cdot19$	2·13·227	$2^6\cdot3\cdot31$
3	53	3·1901	11·523	7·829	3·1951	....	....
4	54	$2^3\cdot23\cdot31$	2·3·7·137	$2^2\cdot1451$	2·2927	$2^4\cdot3^2\cdot41$	2·13·229
5	55	5·7·163	5·1151	$3^3\cdot5\cdot43$	5·1171	5·1181	3·5·397
6	56	$2\cdot3^2\cdot317$	$2^2\cdot1439$	2·2903	$2^5\cdot3\cdot61$	2·2953	$2^2\cdot1489$
7	57	13·439	3·19·101	....	....	3·11·179	7·23·37
8	58	$2^2\cdot1427$	2·2879	$2^4\cdot3\cdot11^2$	2·29·101	$2^2\cdot7\cdot211$	$2\cdot3^2\cdot331$
9	59	3·11·173	13·443	37·157	$3^3\cdot7\cdot31$	19·311	59·101
10	60	2·5·571	$2^7\cdot3^2\cdot5$	2·5·7·83	$2^2\cdot5\cdot293$	2·3·5·197	$2^3\cdot5\cdot149$
11	61	....	7·823	3·13·149	....	23·257	3·1987
12	62	$2^4\cdot3\cdot7\cdot17$	2·43·67	$2^2\cdot1453$	2·3·977	$2^3\cdot739$	2·11·271
13	63	29·197	3·17·113	....	11·13·41	$3^4\cdot73$	67·89
14	64	2·2857	$2^2\cdot11\cdot131$	$2\cdot3^2\cdot17\cdot19$	$2^3\cdot733$	2·2957	$2^2\cdot3\cdot7\cdot71$
15	65	$3^2\cdot5\cdot127$	5·1153	5·1163	3·5·17·23	$5\cdot7\cdot13^2$	5·1193
16	66	$2^2\cdot1429$	$2\cdot3\cdot31^2$	$2^3\cdot727$	2·7·419	$2^2\cdot3\cdot17\cdot29$	2·19·157
17	67	....	73·79	3·7·277	....	61·97	$3^3\cdot13\cdot17$
18	68	2·3·953	$2^3\cdot7\cdot103$	2·2909	$2^2\cdot3^2\cdot163$	2·11·269	$2^4\cdot373$
19	69	7·19·43	$3^2\cdot641$	$11\cdot23^2$	....	3·1973	47·127
20	70	$2^3\cdot5\cdot11\cdot13$	2·5·577	$2^2\cdot3\cdot5\cdot97$	2·5·587	$2^5\cdot5\cdot37$	2·3·5·199
21	71	3·1907	29·199	....	3·19·103	31·191	7·853
22	72	2·2861	$2^2\cdot3\cdot13\cdot37$	2·41·71	$2^4\cdot367$	$2\cdot3^2\cdot7\cdot47$	$2^2\cdot1493$
23	73	59·97	23·251	$3^2\cdot647$	7·839	....	3·11·181
24	74	$2^2\cdot3^3\cdot53$	2·2887	$2^6\cdot7\cdot13$	2·3·11·89	$2^2\cdot1481$	2·29·103
25	75	$5^2\cdot229$	$3\cdot5^2\cdot7\cdot11$	$5^2\cdot233$	$5^3\cdot47$	$3\cdot5^2\cdot79$	$5^2\cdot239$
26	76	2·7·409	$2^4\cdot19^2$	2·3·971	$2^2\cdot13\cdot113$	2·2963	$2^3\cdot3^2\cdot83$
27	77	3·23·83	53·109	....	$3^2\cdot653$	....	43·139
28	78	$2^5\cdot179$	$2\cdot3^3\cdot107$	$2^2\cdot31\cdot47$	2·2939	$2^3\cdot3\cdot13\cdot19$	$2\cdot7^2\cdot61$
29	79	17·337	....	3·29·67	....	$7^2\cdot11^2$	3·1993
30	80	2·3·5·191	$2^2\cdot5\cdot17^2$	2·5·11·53	$2^3\cdot3\cdot5\cdot7^2$	2·5·593	$2^2\cdot5\cdot13\cdot23$
31	81	11·521	3·41·47	$7^3\cdot17$	....	$3^2\cdot659$	....
32	82	$2^2\cdot1433$	$2\cdot7^2\cdot59$	$2^3\cdot3^6$	2·17·173	$2^2\cdot1483$	2·3·997
33	83	$3^2\cdot7^2\cdot13$	....	19·307	3·37·53	17·349	31·193
34	84	2·47·61	$2^3\cdot3\cdot241$	2·2917	$2^2\cdot1471$	2·3·23·43	$2^5\cdot11\cdot17$
35	85	5·31·37	5·13·89	3·5·389	5·11·107	5·1187	$3^2\cdot5\cdot7\cdot19$
36	86	$2^3\cdot3\cdot239$	2·11·263	$2^2\cdot1459$	$2\cdot3^3\cdot109$	$2^4\cdot7\cdot53$	2·41·73
37	87	....	$3^2\cdot643$	13·449	$7\cdot29^2$	3·1979	....
38	88	2·19·151	$2^2\cdot1447$	2·3·7·139	$2^8\cdot23$	2·2969	$2^2\cdot3\cdot499$
39	89	3·1913	7·827	....	3·13·151	....	53·113
40	90	$2^2\cdot5\cdot7\cdot41$	2·3·5·193	$2^4\cdot5\cdot73$	2·5·19·31	$2^2\cdot3^3\cdot5\cdot11$	2·5·599
41	91	....	....	$3^2\cdot11\cdot59$	43·137	13·457	3·1997
42	92	$2\cdot3^2\cdot11\cdot29$	$2^5\cdot181$	2·23·127	$2^2\cdot3\cdot491$	2·2971	$2^3\cdot7\cdot107$
43	93	....	3·1931	....	71·83	3·7·283	13·461
44	94	$2^4\cdot359$	2·2897	$2^2\cdot3\cdot487$	2·7·421	$2^3\cdot743$	$2\cdot3^4\cdot37$
45	95	3·5·383	5·19·61	5·7·167	$3^2\cdot5\cdot131$	5·29·41	5·11·109
46	96	$2\cdot13^2\cdot17$	$2^2\cdot3^2\cdot7\cdot23$	2·37·79	$2^3\cdot11\cdot67$	2·3·991	$2^2\cdot1499$
47	97	7·821	11·17·31	3·1949	....	19·313	3·1999
48	98	$2^2\cdot3\cdot479$	2·13·223	$2^3\cdot17\cdot43$	2·3·983	$2^2\cdot1487$	2·2999
49	99	....	3·1933	....	17·347	$3^2\cdot661$	7·857
50	100	$2\cdot5^3\cdot23$	$2^3\cdot5^2\cdot29$	$2\cdot3^2\cdot5^2\cdot13$	$2^2\cdot5^2\cdot59$	$2\cdot5^2\cdot7\cdot17$	$2^4\cdot3\cdot5^3$

From		6000	6050	6100	6150	6200	6250
To		6050	6100	6150	6200	6250	6300
0	50	$2^4\cdot3\cdot5^3$	$2\cdot5^2\cdot11^2$	$2^2\cdot5^2\cdot61$	$2\cdot3\cdot5^2\cdot41$	$2^3\cdot5^2\cdot31$	$2\cdot5^5$
1	51	$17\cdot353$	$3\cdot2017$	....	....	$3^2\cdot13\cdot53$	$7\cdot19\cdot47$
2	52	$2\cdot3001$	$2^2\cdot17\cdot89$	$2\cdot3^3\cdot113$	$2^3\cdot769$	$2\cdot7\cdot443$	$2^2\cdot3\cdot521$
3	53	$3^2\cdot23\cdot29$	....	$17\cdot359$	$3\cdot7\cdot293$	....	$13^2\cdot37$
4	54	$2^2\cdot19\cdot79$	$2\cdot3\cdot1009$	$2^3\cdot7\cdot109$	$2\cdot17\cdot181$	$2^2\cdot3\cdot11\cdot47$	$2\cdot53\cdot59$
5	55	$5\cdot1201$	$5\cdot7\cdot173$	$3\cdot5\cdot11\cdot37$	$5\cdot1231$	$5\cdot17\cdot73$	$3^2\cdot5\cdot139$
6	56	$2\cdot3\cdot7\cdot11\cdot13$	$2^3\cdot757$	$2\cdot43\cdot71$	$2^2\cdot3^4\cdot19$	$2\cdot29\cdot107$	$2^4\cdot17\cdot23$
7	57	....	$3^2\cdot673$	$31\cdot197$	$47\cdot131$	$3\cdot2069$	....
8	58	$2^3\cdot751$	$2\cdot13\cdot233$	$2^2\cdot3\cdot509$	$2\cdot3079$	$2^6\cdot97$	$2\cdot3\cdot7\cdot149$
9	59	$3\cdot2003$	$73\cdot83$	$41\cdot149$	$3\cdot2053$	$7\cdot887$	$11\cdot569$
10	60	$2\cdot5\cdot601$	$2^2\cdot3\cdot5\cdot101$	$2\cdot5\cdot13\cdot47$	$2^4\cdot5\cdot7\cdot11$	$2\cdot3^3\cdot5\cdot23$	$2^2\cdot5\cdot313$
11	61	....	$11\cdot19\cdot29$	$3^2\cdot7\cdot97$	$61\cdot101$	....	$3\cdot2087$
12	62	$2^2\cdot3^2\cdot167$	$2\cdot7\cdot433$	$2^5\cdot191$	$2\cdot3\cdot13\cdot79$	$2^2\cdot1553$	$2\cdot31\cdot101$
13	63	$7\cdot859$	$3\cdot43\cdot47$	....	....	$3\cdot19\cdot109$	....
14	64	$2\cdot31\cdot97$	$2^4\cdot379$	$2\cdot3\cdot1019$	$2^2\cdot23\cdot67$	$2\cdot13\cdot239$	$2^3\cdot3^3\cdot29$
15	65	$3\cdot5\cdot401$	$5\cdot1213$	$5\cdot1223$	$3^2\cdot5\cdot137$	$5\cdot11\cdot113$	$5\cdot7\cdot179$
16	66	$2^7\cdot47$	$2\cdot3^2\cdot337$	$2^2\cdot11\cdot139$	$2\cdot3083$	$2^3\cdot3\cdot7\cdot37$	$2\cdot13\cdot241$
17	67	$11\cdot547$	....	$3\cdot2039$	$7\cdot881$	....	$3\cdot2089$
18	68	$2\cdot3\cdot17\cdot59$	$2^2\cdot37\cdot41$	$2\cdot7\cdot19\cdot23$	$2^3\cdot3\cdot257$	$2\cdot3109$	$2^2\cdot1567$
19	69	$13\cdot463$	$3\cdot7\cdot17^2$	$29\cdot211$	$31\cdot199$	$3^2\cdot691$	....
20	70	$2^2\cdot5\cdot7\cdot43$	$2\cdot5\cdot607$	$2^3\cdot3^2\cdot5\cdot17$	$2\cdot5\cdot617$	$2^2\cdot5\cdot311$	$2\cdot3\cdot5\cdot11\cdot19$
21	71	$3^3\cdot223$	$13\cdot467$	....	$3\cdot11^2\cdot17$	....	....
22	72	$2\cdot3011$	$2^3\cdot3\cdot11\cdot23$	$2\cdot3061$	$2^2\cdot1543$	$2\cdot3\cdot17\cdot61$	$2^7\cdot7^2$
23	73	$19\cdot317$	....	$3\cdot13\cdot157$	....	$7^2\cdot127$	$3^2\cdot17\cdot41$
24	74	$2^3\cdot3\cdot251$	$2\cdot3037$	$2^2\cdot1531$	$2\cdot3^2\cdot7^3$	$2^4\cdot389$	$2\cdot3137$
25	75	$5^2\cdot241$	$3^5\cdot5^2$	$5^3\cdot7^2$	$5^2\cdot13\cdot19$	$3\cdot5^2\cdot83$	$5^2\cdot251$
26	76	$2\cdot23\cdot131$	$2^2\cdot7^2\cdot31$	$2\cdot3\cdot1021$	$2^5\cdot193$	$2\cdot11\cdot283$	$2^2\cdot3\cdot523$
27	77	$3\cdot7^2\cdot41$	$59\cdot103$	$11\cdot557$	$3\cdot29\cdot71$	$13\cdot479$	....
28	78	$2^2\cdot11\cdot137$	$2\cdot3\cdot1013$	$2^4\cdot383$	$2\cdot3089$	$2^2\cdot3^2\cdot173$	$2\cdot43\cdot73$
29	79	....	....	$3^3\cdot227$	$37\cdot167$	....	$3\cdot7\cdot13\cdot23$
30	80	$2\cdot3^2\cdot5\cdot67$	$2^6\cdot5\cdot19$	$2\cdot5\cdot613$	$2^2\cdot3\cdot5\cdot103$	$2\cdot5\cdot7\cdot89$	$2^3\cdot5\cdot157$
31	81	$37\cdot163$	$3\cdot2027$	....	$7\cdot883$	$3\cdot31\cdot67$	$11\cdot571$
32	82	$2^4\cdot13\cdot29$	$2\cdot3041$	$2^2\cdot3\cdot7\cdot73$	$2\cdot11\cdot281$	$2^3\cdot19\cdot41$	$2\cdot3^2\cdot349$
33	83	$3\cdot2011$	$7\cdot11\cdot79$	....	$3^3\cdot229$	$23\cdot271$	$61\cdot103$
34	84	$2\cdot7\cdot431$	$2^2\cdot3^2\cdot13^2$	$2\cdot3067$	$2^3\cdot773$	$2\cdot3\cdot1039$	$2^2\cdot1571$
35	85	$5\cdot17\cdot71$	$5\cdot1217$	$3\cdot5\cdot409$	$5\cdot1237$	$5\cdot29\cdot43$	$3\cdot5\cdot419$
36	86	$2^2\cdot3\cdot503$	$2\cdot17\cdot179$	$2^3\cdot13\cdot59$	$2\cdot3\cdot1031$	$2^2\cdot1559$	$2\cdot7\cdot449$
37	87	....	$3\cdot2029$	$17\cdot19^2$	$23\cdot269$	$3^4\cdot7\cdot11$	....
38	88	$2\cdot3019$	$2^3\cdot761$	$2\cdot3^2\cdot11\cdot31$	$2^2\cdot7\cdot13\cdot17$	$2\cdot3119$	$2^4\cdot3\cdot131$
39	89	$3^2\cdot11\cdot61$	....	$7\cdot877$	$3\cdot2063$	$17\cdot367$	$19\cdot331$
40	90	$2^3\cdot5\cdot151$	$2\cdot3\cdot5\cdot7\cdot29$	$2^2\cdot5\cdot307$	$2\cdot5\cdot619$	$2^5\cdot3\cdot5\cdot13$	$2\cdot5\cdot17\cdot37$
41	91	$7\cdot863$	....	$3\cdot23\cdot89$	$41\cdot151$	79^2	$3^3\cdot233$
42	92	$2\cdot3\cdot19\cdot53$	$2^2\cdot1523$	$2\cdot37\cdot83$	$2^4\cdot3^2\cdot43$	$2\cdot3121$	$2^2\cdot11^2\cdot13$
43	93	....	$3^2\cdot677$	....	$11\cdot563$	$3\cdot2081$	$7\cdot29\cdot31$
44	94	$2^2\cdot1511$	$2\cdot11\cdot277$	$2^{11}\cdot3$	$2\cdot19\cdot163$	$2^2\cdot7\cdot223$	$2\cdot3\cdot1049$
45	95	$3\cdot5\cdot13\cdot31$	$5\cdot23\cdot53$	$5\cdot1229$	$3\cdot5\cdot7\cdot59$	$5\cdot1249$	$5\cdot1259$
46	96	$2\cdot3023$	$2^4\cdot3\cdot127$	$2\cdot7\cdot439$	$2^2\cdot1549$	$2\cdot3^2\cdot347$	$2^3\cdot787$
47	97	....	$7\cdot13\cdot67$	$3^2\cdot683$	....	....	$3\cdot2099$
48	98	$2^5\cdot3^3\cdot7$	$2\cdot3049$	$2^2\cdot29\cdot53$	$2\cdot3\cdot1033$	$2^3\cdot11\cdot71$	$2\cdot47\cdot67$
49	99	$23\cdot263$	$3\cdot19\cdot107$	$11\cdot13\cdot43$	....	$3\cdot2083$	....
50	100	$2\cdot5^2\cdot11^2$	$2^2\cdot5^2\cdot61$	$2\cdot3\cdot5^2\cdot41$	$2^3\cdot5^2\cdot31$	$2\cdot5^5$	$2^2\cdot3^2\cdot5^2\cdot7$

From	To	6300–6350	6350–6400	6400–6450	6450–6500	6500–6550	6550–6600
0	50	$2^2\cdot3^2\cdot5^2\cdot7$	$2\cdot5^2\cdot127$	$2^8\cdot5^2$	$2\cdot3\cdot5^2\cdot43$	$2^2\cdot5^3\cdot13$	$2\cdot5^2\cdot131$
1	51	....	3·29·73	37·173	....	3·11·197	....
2	52	2·23·137	$2^4\cdot397$	2·3·11·97	$2^2\cdot1613$	2·3251	$2^3\cdot3^2\cdot7\cdot13$
3	53	3·11·191	....	19·337	$3^3\cdot239$	7·929	....
4	54	$2^5\cdot197$	$2\cdot3^2\cdot353$	$2^2\cdot1601$	2·7·461	$2^3\cdot3\cdot271$	2·29·113
5	55	5·13·97	5·31·41	3·5·7·61	5·1291	5·1301	3·5·19·23
6	56	2·3·1051	$2^2\cdot7\cdot227$	2·3203	$2^3\cdot3\cdot269$	2·3253	$2^2\cdot11\cdot149$
7	57	7·17·53	3·13·163	43·149	11·587	$3^3\cdot241$	79·83
8	58	$2^2\cdot19\cdot83$	$2\cdot11\cdot17^2$	$2^3\cdot3^2\cdot89$	2·3229	$2^2\cdot1627$	2·3·1093
9	59	$3^2\cdot701$	....	13·17·29	3·2153	23·283	7·937
10	60	2·5·631	$2^3\cdot3\cdot5\cdot53$	2·5·641	$2^2\cdot5\cdot17\cdot19$	2·3·5·7·31	$2^5\cdot5\cdot41$
11	61	....	....	3·2137	7·13·71	17·383	3^8
12	62	$2^3\cdot3\cdot263$	2·3181	$2^2\cdot7\cdot229$	$2\cdot3^2\cdot359$	$2^4\cdot11\cdot37$	2·17·193
13	63	59·107	$3^2\cdot7\cdot101$	$11^2\cdot53$	23·281	3·13·167	....
14	64	2·7·11·41	$2^2\cdot37\cdot43$	2·3·1069	$2^6\cdot101$	2·3257	$2^2\cdot3\cdot547$
15	65	3·5·421	5·19·67	5·1283	3·5·431	5·1303	5·13·101
16	66	$2^2\cdot1579$	2·3·1061	$2^4\cdot401$	2·53·61	$2^2\cdot3^2\cdot181$	$2\cdot7^2\cdot67$
17	67	....	....	$3^2\cdot23\cdot31$	29·223	$7^3\cdot19$	3·11·199
18	68	$2\cdot3^5\cdot13$	$2^5\cdot199$	2·3209	$2^2\cdot3\cdot7^2\cdot11$	2·3259	$2^3\cdot821$
19	69	71·89	3·11·193	$7^2\cdot131$	....	3·41·53	....
20	70	$2^4\cdot5\cdot79$	$2\cdot5\cdot7^2\cdot13$	$2^2\cdot3\cdot5\cdot107$	2·5·647	$2^3\cdot5\cdot163$	$2\cdot3^2\cdot5\cdot73$
21	71	$3\cdot7^2\cdot43$	23·277	....	$3^2\cdot719$	....	....
22	72	2·29·109	$2^2\cdot3^3\cdot59$	$2\cdot13^2\cdot19$	$2^3\cdot809$	2·3·1087	$2^2\cdot31\cdot53$
23	73	....	....	3·2141	....	11·593	3·7·313
24	74	$2^2\cdot3\cdot17\cdot31$	2·3187	$2^3\cdot11\cdot73$	2·3·13·83	$2^2\cdot7\cdot233$	2·19·173
25	75	$5^2\cdot11\cdot23$	$3\cdot5^3\cdot17$	$5^2\cdot257$	$5^2\cdot7\cdot37$	$3^2\cdot5^2\cdot29$	$5^2\cdot263$
26	76	2·3163	$2^3\cdot797$	$2\cdot3^3\cdot7\cdot17$	$2^2\cdot1619$	2·13·251	$2^4\cdot3\cdot137$
27	77	$3^2\cdot19\cdot37$	7·911	....	3·17·127	61·107	....
28	78	$2^3\cdot7\cdot113$	2·3·1063	$2^2\cdot1607$	2·41·79	$2^7\cdot3\cdot17$	2·11·13·23
29	79	....	....	3·2143	11·19·31	....	$3^2\cdot17\cdot43$
30	80	2·3·5·211	$2^2\cdot5\cdot11\cdot29$	2·5·643	$2^4\cdot3^4\cdot5$	2·5·653	$2^2\cdot5\cdot7\cdot47$
31	81	13·487	$3^2\cdot709$	59·109	....	3·7·311	....
32	82	$2^2\cdot1583$	2·3191	$2^5\cdot3\cdot67$	2·7·463	$2^2\cdot23\cdot71$	2·3·1097
33	83	3·2111	13·491	7·919	3·2161	47·139	29·227
34	84	2·3167	$2^4\cdot3\cdot7\cdot19$	2·3217	$2^2\cdot1621$	$2\cdot3^3\cdot11^2$	$2^3\cdot823$
35	85	5·7·181	5·1277	$3^2\cdot5\cdot11\cdot13$	5·1297	5·1307	3·5·439
36	86	$2^6\cdot3^2\cdot11$	2·31·103	$2^2\cdot1609$	2·3·23·47	$2^3\cdot19\cdot43$	2·37·89
37	87	....	3·2129	41·157	13·499	3·2179	7·941
38	88	2·3169	$2^2\cdot1597$	2·3·29·37	$2^3\cdot811$	2·7·467	$2^2\cdot3^3\cdot61$
39	89	3·2113	....	47·137	$3^2\cdot7\cdot103$	13·503	11·599
40	90	$2^2\cdot5\cdot317$	$2\cdot3^2\cdot5\cdot71$	$2^3\cdot5\cdot7\cdot23$	2·5·11·59	$2^2\cdot3\cdot5\cdot109$	2·5·659
41	91	17·373	7·11·83	3·19·113	....	31·211	$3\cdot13^3$
42	92	2·3·7·151	$2^3\cdot17\cdot47$	2·3221	$2^2\cdot3\cdot541$	2·3271	$2^6\cdot103$
43	93	....	3·2131	17·379	43·151	$3^2\cdot727$	19·347
44	94	$2^3\cdot13\cdot61$	2·23·139	$2^2\cdot3^2\cdot179$	2·17·191	$2^4\cdot409$	2·3·7·157
45	95	$3^3\cdot5\cdot47$	5·1279	5·1289	3·5·433	5·7·11·17	5·1319
46	96	2·19·167	$2^2\cdot3\cdot13\cdot41$	2·11·293	$2^5\cdot7\cdot29$	2·3·1091	$2^2\cdot17\cdot97$
47	97	11·577	....	3·7·307	73·89	....	$3^2\cdot733$
48	98	$2^2\cdot3\cdot23^2$	2·7·457	$2^4\cdot13\cdot31$	$2\cdot3^2\cdot19^2$	$2^2\cdot1637$	2·3299
49	99	7·907	$3^4\cdot79$	....	67·97	3·37·59	....
50	100	$2\cdot5^2\cdot127$	$2^8\cdot5^2$	$2\cdot3\cdot5^2\cdot43$	$2^2\cdot5^3\cdot13$	$2\cdot5^2\cdot131$	$2^3\cdot3\cdot5^2\cdot11$

From	To	6600 6650	6650 6700	6700 6750	6750 6800	6800 6850	6850 6900
0	50	$2^3\cdot3\cdot5^2\cdot11$	$2\cdot5^2\cdot7\cdot19$	$2^2\cdot5^2\cdot67$	$2\cdot3^3\cdot5^3$	$2^4\cdot5^2\cdot17$	$2\cdot5^2\cdot137$
1	51	7·23·41	$3^2\cdot739$	....	43·157	3·2267	13·17·31
2	52	2·3301	$2^2\cdot1663$	2·3·1117	$2^5\cdot211$	2·19·179	$2^2\cdot3\cdot571$
3	53	3·31·71	....	....	3·2251	....	7·11·89
4	54	$2^2\cdot13\cdot127$	2·3·1109	$2^4\cdot419$	2·11·307	$2^2\cdot3^5\cdot7$	2·23·149
5	55	5·1321	$5\cdot11^3$	$3^2\cdot5\cdot149$	5·7·193	5·1361	3·5·457
6	56	$2\cdot3^2\cdot367$	$2^9\cdot13$	2·7·479	$2^2\cdot3\cdot563$	2·41·83	$2^3\cdot857$
7	57	....	3·7·317	19·353	29·233	3·2269	....
8	58	$2^4\cdot7\cdot59$	2·3329	$2^2\cdot3\cdot13\cdot43$	2·31·109	$2^3\cdot23\cdot37$	$2\cdot3^3\cdot127$
9	59	3·2203	....	....	$3^2\cdot751$	11·619	19^3
10	60	2·5·661	$2^2\cdot3^2\cdot5\cdot37$	2·5·11·61	$2^3\cdot5\cdot13^2$	2·3·5·227	$2^2\cdot5\cdot7^3$
11	61	11·601	....	3·2237	....	$7^2\cdot139$	3·2287
12	62	$2^2\cdot3\cdot19\cdot29$	2·3331	$2^3\cdot839$	$2\cdot3\cdot7^2\cdot23$	$2^2\cdot13\cdot131$	2·47·73
13	63	17·389	3·2221	$7^2\cdot137$	....	$3^2\cdot757$	....
14	64	2·3307	$2^3\cdot7^2\cdot17$	$2\cdot3^2\cdot373$	$2^2\cdot19\cdot89$	2·3407	$2^4\cdot3\cdot11\cdot13$
15	65	$3^3\cdot5\cdot7^2$	5·31·43	5·17·79	3·5·11·41	5·29·47	5·1373
16	66	$2^3\cdot827$	2·3·11·101	$2^2\cdot23\cdot73$	2·17·199	$2^5\cdot3\cdot71$	2·3433
17	67	13·509	59·113	3·2239	67·101	17·401	$3^2\cdot7\cdot109$
18	68	2·3·1103	$2^2\cdot1667$	2·3359	$2^4\cdot3^2\cdot47$	2·7·487	$2^2\cdot17\cdot101$
19	69	....	$3^3\cdot13\cdot19$	....	7·967	3·2273	....
20	70	$2^2\cdot5\cdot331$	2·5·23·29	$2^6\cdot3\cdot5\cdot7$	2·5·677	$2^2\cdot5\cdot11\cdot31$	2·3·5·229
21	71	3·2207	7·953	11·13·47	3·37·61	19·359	....
22	72	2·7·11·43	$2^4\cdot3\cdot139$	2·3361	$2^2\cdot1693$	$2\cdot3^2\cdot379$	$2^3\cdot859$
23	73	37·179	....	$3^4\cdot83$	13·521	....	3·29·79
24	74	$2^5\cdot3^2\cdot23$	2·47·71	$2^2\cdot41^2$	2·3·1129	$2^3\cdot853$	2·7·491
25	75	$5^3\cdot53$	$3\cdot5^2\cdot89$	$5^2\cdot269$	$5^2\cdot271$	$3\cdot5^2\cdot7\cdot13$	$5^4\cdot11$
26	76	2·3313	$2^2\cdot1669$	2·3·19·59	$2^3\cdot7\cdot11^2$	2·3413	$2^2\cdot3^2\cdot191$
27	77	$3\cdot47^2$	11·607	$7\cdot31^2$	$3^3\cdot251$	....	$13\cdot23^2$
28	78	$2^2\cdot1657$	$2\cdot3^2\cdot7\cdot53$	$2^3\cdot29^2$	2·3389	$2^2\cdot3\cdot569$	2·19·181
29	79	7·947	....	3·2243	....	....	3·2293
30	80	2·3·5·13·17	$2^3\cdot5\cdot167$	2·5·673	$2^2\cdot3\cdot5\cdot113$	2·5·683	$2^5\cdot5\cdot43$
31	81	19·349	3·17·131	53·127	....	$3^3\cdot11\cdot23$	7·983
32	82	$2^3\cdot829$	2·13·257	$2^2\cdot3^2\cdot11\cdot17$	2·3391	$2^4\cdot7\cdot61$	2·3·31·37
33	83	$3^2\cdot11\cdot67$	41·163	....	3·7·17·19	....	....
34	84	2·31·107	$2^2\cdot3\cdot557$	2·7·13·37	$2^7\cdot53$	2·3·17·67	$2^2\cdot1721$
35	85	5·1327	5·7·191	3·5·449	5·23·59	5·1367	$3^4\cdot5\cdot17$
36	86	$2^2\cdot3\cdot7\cdot79$	2·3343	$2^4\cdot421$	$2\cdot3^2\cdot13\cdot29$	$2^2\cdot1709$	2·11·313
37	87	....	$3^2\cdot743$	....	11·617	3·43·53	71·97
38	88	2·3319	$2^5\cdot11\cdot19$	2·3·1123	$2^2\cdot1697$	2·13·263	$2^3\cdot3\cdot7\cdot41$
39	89	3·2213	....	23·293	3·31·73	7·977	83^2
40	90	$2^4\cdot5\cdot83$	2·3·5·223	$2^2\cdot5\cdot337$	2·5·7·97	$2^3\cdot3^2\cdot5\cdot19$	2·5·13·53
41	91	29·229	....	$3^2\cdot7\cdot107$	....	....	3·2297
42	92	$2\cdot3^4\cdot41$	$2^2\cdot7\cdot239$	2·3371	$2^3\cdot3\cdot283$	2·11·311	$2^2\cdot1723$
43	93	7·13·73	3·23·97	11·613	....	3·2281	61·113
44	94	$2^2\cdot11\cdot151$	2·3347	$2^3\cdot3\cdot281$	2·43·79	$2^2\cdot29\cdot59$	$2\cdot3^2\cdot383$
45	95	3·5·443	5·13·103	5·19·71	$3^2\cdot5\cdot151$	$5\cdot37^2$	5·7·197
46	96	2·3323	$2^3\cdot3^3\cdot31$	2·3373	$2^2\cdot1699$	2·3·7·163	$2^4\cdot431$
47	97	$17^2\cdot23$	37·181	3·13·173	7·971	41·167	$3\cdot11^2\cdot19$
48	98	$2^3\cdot3\cdot277$	2·17·197	$2^2\cdot7\cdot241$	2·3·11·103	$2^6\cdot107$	2·3449
49	99	61·109	3·7·11·29	17·397	13·523	$3^2\cdot761$	....
50	100	$2\cdot5^2\cdot7\cdot19$	$2^2\cdot5^2\cdot67$	$2\cdot3^3\cdot5^3$	$2^4\cdot5^2\cdot17$	$2\cdot5^2\cdot137$	$2^2\cdot3\cdot5^2\cdot23$

From		6900	6950	7000	7050	7100	7150
To		6950	7000	7050	7100	7150	7200
0	50	$2^2\cdot3\cdot5^2\cdot23$	$2\cdot5^2\cdot139$	$2^3\cdot5^3\cdot7$	$2\cdot3\cdot5^2\cdot47$	$2^2\cdot5^2\cdot71$	$2\cdot5^2\cdot11\cdot13$
1	51	$67\cdot103$	$3\cdot7\cdot331$	....	$11\cdot641$	$3^3\cdot263$	....
2	52	$2\cdot7\cdot17\cdot29$	$2^3\cdot11\cdot79$	$2\cdot3^2\cdot389$	$2^2\cdot41\cdot43$	$2\cdot53\cdot67$	$2^4\cdot3\cdot149$
3	53	$3^2\cdot13\cdot59$	$17\cdot409$	$47\cdot149$	$3\cdot2351$	....	$23\cdot311$
4	54	$2^3\cdot863$	$2\cdot3\cdot19\cdot61$	$2^2\cdot17\cdot103$	$2\cdot3527$	$2^6\cdot3\cdot37$	$2\cdot7^2\cdot73$
5	55	$5\cdot1381$	$5\cdot13\cdot107$	$3\cdot5\cdot467$	$5\cdot17\cdot83$	$5\cdot7^2\cdot29$	$3^3\cdot5\cdot53$
6	56	$2\cdot3\cdot1151$	$2^2\cdot37\cdot47$	$2\cdot31\cdot113$	$2^4\cdot3^2\cdot7^2$	$2\cdot11\cdot17\cdot19$	$2^2\cdot1789$
7	57	....	$3^2\cdot773$	$7^2\cdot11\cdot13$	....	$3\cdot23\cdot103$	$17\cdot421$
8	58	$2^2\cdot11\cdot157$	$2\cdot7^2\cdot71$	$2^5\cdot3\cdot73$	$2\cdot3529$	$2^2\cdot1777$	$2\cdot3\cdot1193$
9	59	$3\cdot7^2\cdot47$	....	$43\cdot163$	$3\cdot13\cdot181$	....	....
10	60	$2\cdot5\cdot691$	$2^4\cdot3\cdot5\cdot29$	$2\cdot5\cdot701$	$2^2\cdot5\cdot353$	$2\cdot3^2\cdot5\cdot79$	$2^3\cdot3\cdot179$
11	61	....	....	$3\cdot19\cdot41$	$23\cdot307$	$13\cdot547$	$3\cdot7\cdot11\cdot31$
12	62	$2^8\cdot3^3$	$2\cdot59^2$	$2^2\cdot1753$	$2\cdot3\cdot11\cdot107$	$2^3\cdot7\cdot127$	$2\cdot3581$
13	63	$31\cdot223$	$3\cdot11\cdot211$	....	$7\cdot1009$	$3\cdot2371$	$13\cdot19\cdot29$
14	64	$2\cdot3457$	$2^2\cdot1741$	$2\cdot3\cdot7\cdot167$	$2^3\cdot883$	$2\cdot3557$	$2^2\cdot3^2\cdot199$
15	65	$3\cdot5\cdot461$	$5\cdot7\cdot199$	$5\cdot23\cdot61$	$3^2\cdot5\cdot157$	$5\cdot1423$	$5\cdot1433$
16	66	$2^2\cdot7\cdot13\cdot19$	$2\cdot3^4\cdot43$	$2^3\cdot877$	$2\cdot3533$	$2^2\cdot3\cdot593$	$2\cdot3583$
17	67	....	....	$3\cdot2339$	$37\cdot191$	$11\cdot647$	$3\cdot2389$
18	68	$2\cdot3\cdot1153$	$2^3\cdot13\cdot67$	$2\cdot11^2\cdot29$	$2^2\cdot3\cdot19\cdot31$	$2\cdot3559$	$2^{10}\cdot7$
19	69	$11\cdot17\cdot37$	$3\cdot23\cdot101$	....	....	$3^2\cdot7\cdot113$	$67\cdot107$
20	70	$2^3\cdot5\cdot173$	$2\cdot5\cdot17\cdot41$	$2^2\cdot3^3\cdot5\cdot13$	$2\cdot5\cdot7\cdot101$	$2^4\cdot5\cdot89$	$2\cdot3\cdot5\cdot239$
21	71	$3^2\cdot769$	....	$7\cdot17\cdot59$	$3\cdot2357$	....	$71\cdot101$
22	72	$2\cdot3461$	$2^2\cdot3\cdot7\cdot83$	$2\cdot3511$	$2^5\cdot13\cdot17$	$2\cdot3\cdot1187$	$2^2\cdot11\cdot163$
23	73	$7\cdot23\cdot43$	$19\cdot367$	$3\cdot2341$	$11\cdot643$	$17\cdot419$	$3^2\cdot797$
24	74	$2^2\cdot3\cdot577$	$2\cdot11\cdot317$	$2^4\cdot439$	$2\cdot3^3\cdot131$	$2^2\cdot13\cdot137$	$2\cdot17\cdot211$
25	75	$5^2\cdot277$	$3^2\cdot5^2\cdot31$	$5^2\cdot281$	$5^2\cdot283$	$3\cdot5^3\cdot19$	$5^2\cdot7\cdot41$
26	76	$2\cdot3463$	$2^6\cdot109$	$2\cdot3\cdot1171$	$2^2\cdot29\cdot61$	$2\cdot7\cdot509$	$2^3\cdot3\cdot13\cdot23$
27	77	$3\cdot2309$	....	....	$3\cdot7\cdot337$	....	....
28	78	$2^4\cdot433$	$2\cdot3\cdot1163$	$2^2\cdot7\cdot251$	$2\cdot3539$	$2^3\cdot3^4\cdot11$	$2\cdot37\cdot97$
29	79	$13^2\cdot41$	$7\cdot997$	$3^2\cdot11\cdot71$	....	....	$3\cdot2393$
30	80	$2\cdot3^2\cdot5\cdot7\cdot11$	$2^2\cdot5\cdot349$	$2\cdot5\cdot19\cdot37$	$2^3\cdot3\cdot5\cdot59$	$2\cdot5\cdot23\cdot31$	$2^2\cdot5\cdot359$
31	81	$29\cdot239$	$3\cdot13\cdot179$	$79\cdot89$	$73\cdot97$	$3\cdot2377$	$43\cdot167$
32	82	$2^2\cdot1733$	$2\cdot3491$	$2^3\cdot3\cdot293$	$2\cdot3541$	$2^2\cdot1783$	$2\cdot3^3\cdot7\cdot19$
33	83	$3\cdot2311$	....	$13\cdot541$	$3^2\cdot787$	$7\cdot1019$	$11\cdot653$
34	84	$2\cdot3467$	$2^3\cdot3^2\cdot97$	$2\cdot3517$	$2^2\cdot7\cdot11\cdot23$	$2\cdot3\cdot29\cdot41$	$2^4\cdot449$
35	85	$5\cdot19\cdot73$	$5\cdot11\cdot127$	$3\cdot5\cdot7\cdot67$	$5\cdot13\cdot109$	$5\cdot1427$	$3\cdot5\cdot479$
36	86	$2^3\cdot3\cdot17^2$	$2\cdot7\cdot499$	$2^2\cdot1759$	$2\cdot3\cdot1181$	$2^5\cdot223$	$2\cdot3593$
37	87	$7\cdot991$	$3\cdot17\cdot137$	$31\cdot227$	$19\cdot373$	$3^2\cdot13\cdot61$	....
38	88	$2\cdot3469$	$2^2\cdot1747$	$2\cdot3^2\cdot17\cdot23$	$2^4\cdot443$	$2\cdot43\cdot83$	$2^2\cdot3\cdot599$
39	89	$3^3\cdot257$	$29\cdot241$	....	$3\cdot17\cdot139$	$11^2\cdot59$	$7\cdot13\cdot79$
40	90	$2^2\cdot5\cdot347$	$2\cdot3\cdot5\cdot233$	$2^7\cdot5\cdot11$	$2\cdot5\cdot709$	$2^2\cdot3\cdot5\cdot7\cdot17$	$2\cdot5\cdot719$
41	91	$11\cdot631$	....	$3\cdot2347$	$7\cdot1013$	$37\cdot193$	$3^2\cdot17\cdot47$
42	92	$2\cdot3\cdot13\cdot89$	$2^4\cdot19\cdot23$	$2\cdot7\cdot503$	$2^2\cdot3^2\cdot197$	$2\cdot3571$	$2^3\cdot29\cdot31$
43	93	$53\cdot131$	$3^3\cdot7\cdot37$	....	$41\cdot173$	$3\cdot2381$	....
44	94	$2^5\cdot7\cdot31$	$2\cdot13\cdot269$	$2^2\cdot3\cdot587$	$2\cdot3547$	$2^3\cdot19\cdot47$	$2\cdot3\cdot11\cdot109$
45	95	$3\cdot5\cdot463$	$5\cdot1399$	$5\cdot1409$	$3\cdot5\cdot11\cdot43$	$5\cdot1429$	$5\cdot1439$
46	96	$2\cdot23\cdot151$	$2^2\cdot3\cdot11\cdot53$	$2\cdot13\cdot271$	$2^3\cdot887$	$2\cdot3^2\cdot397$	$2^2\cdot7\cdot257$
47	97	....	....	$3^5\cdot29$	$47\cdot151$	$7\cdot1021$	$3\cdot2399$
48	98	$2^2\cdot3^2\cdot193$	$3\cdot3499$	$2^3\cdot881$	$2\cdot3\cdot7\cdot13^2$	$2^2\cdot1787$	$2\cdot59\cdot61$
49	99	....	$3\cdot2333$	$7\cdot19\cdot53$	$31\cdot229$	$3\cdot2383$	$23\cdot313$
50	100	$2\cdot5^2\cdot139$	$2^3\cdot5^3\cdot7$	$2\cdot3\cdot5^2\cdot47$	$2^2\cdot5^2\cdot71$	$2\cdot5^2\cdot11\cdot13$	$2^5\cdot3^2\cdot5^2$

From	To	7200 – 7250	7250 – 7300	7300 – 7350	7350 – 7400	7400 – 7450	7450 – 7500
0	50	$2^5\cdot3^2\cdot5^2$	$2\cdot5^3\cdot29$	$2^2\cdot5^2\cdot73$	$2\cdot3\cdot5^2\cdot7^2$	$2^3\cdot5^2\cdot37$	$2\cdot5^2\cdot149$
1	51	19·379	3·2417	$7^2\cdot149$	....	3·2467	....
2	52	2·13·277	$2^2\cdot7^2\cdot37$	2·3·1217	$2^3\cdot919$	2·3701	$2^2\cdot3^4\cdot23$
3	53	$3\cdot7^4$	....	67·109	$3^2\cdot19\cdot43$	11·673	29·257
4	54	$2^2\cdot1801$	$2\cdot3^2\cdot13\cdot31$	$2^3\cdot11\cdot83$	2·3677	$2^2\cdot3\cdot617$	2·3727
5	55	5·11·131	5·1451	3·5·487	5·1471	5·1481	3·5·7·71
6	56	2·3·1201	$2^3\cdot907$	2·13·281	$2^2\cdot3\cdot613$	$2\cdot7\cdot23^2$	$2^5\cdot233$
7	57	....	3·41·59	....	7·1051	$3^2\cdot823$	....
8	58	$2^3\cdot17\cdot53$	2·19·191	$2^2\cdot3^2\cdot7\cdot29$	2·13·283	$2^4\cdot463$	2·3·11·113
9	59	$3^4\cdot89$	7·17·61	....	3·11·223	31·239	....
10	60	2·5·7·103	$2^2\cdot3\cdot5\cdot11^2$	2·5·17·43	$2^6\cdot5\cdot23$	2·3·5·13·19	$2^2\cdot5\cdot373$
11	61	....	53·137	3·2437	17·433	....	$3^2\cdot829$
12	62	$2^2\cdot3\cdot601$	2·3631	$2^4\cdot457$	$2\cdot3^2\cdot409$	$2^2\cdot17\cdot109$	2·7·13·41
13	63	....	$3^3\cdot269$	71·103	37·199	3·7·353	17·439
14	64	2·3607	$2^5\cdot277$	2·3·23·53	$2^2\cdot7\cdot263$	2·11·337	$2^3\cdot3\cdot311$
15	65	3·5·13·37	5·1453	5·7·11·19	3·5·491	5·1483	5·1493
16	66	$2^4\cdot11\cdot41$	2·3·7·173	$2^2\cdot31\cdot59$	2·29·127	$2^3\cdot3^2\cdot103$	2·3733
17	67	7·1031	$13^2\cdot43$	$3^3\cdot271$	53·139	....	3·19·131
18	68	$2\cdot3^2\cdot401$	$2^2\cdot23\cdot79$	2·3659	$2^3\cdot3\cdot307$	2·3709	$2^2\cdot1867$
19	69	....	3·2423	13·563	....	3·2473	7·11·97
20	70	$2^2\cdot5\cdot19^2$	2·5·727	$2^3\cdot3\cdot5\cdot61$	2·5·11·67	$2^2\cdot5\cdot7\cdot53$	$2\cdot3^2\cdot5\cdot83$
21	71	3·29·83	11·661	....	$3^4\cdot7\cdot13$	41·181	31·241
22	72	2·23·157	$2^3\cdot3^2\cdot101$	2·7·523	$2^2\cdot19\cdot97$	2·3·1237	$2^4\cdot467$
23	73	31·233	7·1039	3·2441	73·101	13·571	3·47·53
24	74	$2^3\cdot3\cdot7\cdot43$	2·3637	$2^2\cdot1831$	2·3·1229	$2^8\cdot29$	2·37·101
25	75	$5^2\cdot17^2$	$3\cdot5^2\cdot97$	$5^2\cdot293$	$5^3\cdot59$	$3^3\cdot5^2\cdot11$	$5^2\cdot13\cdot23$
26	76	2·3613	$2^2\cdot17\cdot107$	$2\cdot3^2\cdot11\cdot37$	$2^4\cdot461$	2·47·79	$2^2\cdot3\cdot7\cdot89$
27	77	$3^2\cdot11\cdot73$	19·383	17·431	3·2459	7·1061	....
28	78	$2^2\cdot13\cdot139$	2·3·1213	$2^5\cdot229$	2·7·17·31	$2^2\cdot3\cdot619$	2·3739
29	79	....	29·251	3·7·349	47·157	17·19·23	$3^3\cdot277$
30	80	2·3·5·241	$2^4\cdot5\cdot7\cdot13$	2·5·733	$2^2\cdot3^2\cdot5\cdot41$	2·5·743	$2^3\cdot5\cdot11\cdot17$
31	81	7·1033	$3^2\cdot809$	....	$11^2\cdot61$	3·2477	....
32	82	$2^6\cdot113$	2·11·331	$2^2\cdot3\cdot13\cdot47$	2·3691	$2^3\cdot929$	2·3·29·43
33	83	3·2411	....	....	3·23·107	....	7·1069
34	84	2·3617	$2^2\cdot3\cdot607$	2·19·193	$2^3\cdot13\cdot71$	$2\cdot3^2\cdot7\cdot59$	$2^2\cdot1871$
35	85	5·1447	5·31·47	$3^2\cdot5\cdot163$	5·7·211	5·1487	3·5·499
36	86	$2^2\cdot3^3\cdot67$	2·3643	$2^3\cdot7\cdot131$	2·3·1231	$2^2\cdot11\cdot13^2$	2·19·197
37	87	....	3·7·347	11·23·29	83·89	3·37·67	....
38	88	2·7·11·47	$2^3\cdot911$	2·3·1223	$2^2\cdot1847$	2·3719	$2^6\cdot3^2\cdot13$
39	89	3·19·127	37·197	41·179	$3^2\cdot821$	43·173	....
40	90	$2^3\cdot5\cdot181$	$2\cdot3^6\cdot5$	$2^2\cdot5\cdot367$	2·5·739	$2^4\cdot3\cdot5\cdot31$	2·5·7·107
41	91	13·557	23·317	3·2447	19·389	7·1063	3·11·227
42	92	2·3·17·71	$2^2\cdot1823$	2·3671	$2^5\cdot3\cdot7\cdot11$	$2\cdot61^2$	$2^2\cdot1873$
43	93	....	3·11·13·17	7·1049	....	$3^2\cdot827$	59·127
44	94	$2^2\cdot1811$	2·7·521	$2^4\cdot3^3\cdot17$	2·3697	$2^2\cdot1861$	2·3·1249
45	95	$3^2\cdot5\cdot7\cdot23$	5·1459	5·13·113	3·5·17·29	5·1489	5·1499
46	96	2·3623	$2^7\cdot3\cdot19$	2·3673	$2^2\cdot43^2$	2·3·17·73	$2^3\cdot937$
47	97	....	....	3·31·79	13·569	11·677	$3^2\cdot7^2\cdot17$
48	98	$2^4\cdot3\cdot151$	2·41·89	$2^2\cdot11\cdot167$	$2\cdot3^3\cdot137$	$2^3\cdot7^2\cdot19$	2·23·163
49	99	11·659	$3^2\cdot811$	....	$7^2\cdot151$	3·13·191	....
50	100	$2\cdot5^3\cdot29$	$2^2\cdot5^2\cdot73$	$2\cdot3\cdot5^2\cdot7^2$	$2^3\cdot5^2\cdot37$	$2\cdot5^2\cdot149$	$2^2\cdot3\cdot5^4$

From	To	7500–7550	7550–7600	7600–7650	7650–7700	7700–7750	7750–7800
0	50	$2^2\cdot3\cdot5^4$	$2\cdot5^2\cdot151$	$2^4\cdot5^2\cdot19$	$2\cdot3^2\cdot5^2\cdot17$	$2^2\cdot5^2\cdot7\cdot11$	$2\cdot5^3\cdot31$
1	51	$13\cdot577$	$3^2\cdot839$	$11\cdot691$	$7\cdot1093$	$3\cdot17\cdot151$	$23\cdot337$
2	52	$2\cdot11^2\cdot31$	$2^7\cdot59$	$2\cdot3\cdot7\cdot181$	$2^2\cdot1913$	$2\cdot3851$	$2^3\cdot3\cdot17\cdot19$
3	53	$3\cdot41\cdot61$	$7\cdot13\cdot83$	....	$3\cdot2551$	....	....
4	54	$2^4\cdot7\cdot67$	$2\cdot3\cdot1259$	$2^2\cdot1901$	$2\cdot43\cdot89$	$2^3\cdot3^2\cdot107$	$2\cdot3877$
5	55	$5\cdot19\cdot79$	$5\cdot1511$	$3^2\cdot5\cdot13^2$	$5\cdot1531$	$5\cdot23\cdot67$	$3\cdot5\cdot11\cdot47$
6	56	$2\cdot3^3\cdot139$	$2^2\cdot1889$	$2\cdot3803$	$2^3\cdot3\cdot11\cdot29$	$2\cdot3853$	$2^2\cdot7\cdot277$
7	57	....	$3\cdot11\cdot229$	....	$13\cdot19\cdot31$	$3\cdot7\cdot367$	....
8	58	$2^2\cdot1877$	$2\cdot3779$	$2^3\cdot3\cdot317$	$2\cdot7\cdot547$	$2^2\cdot41\cdot47$	$2\cdot3^2\cdot431$
9	59	$3\cdot2503$	....	$7\cdot1087$	$3^2\cdot23\cdot37$	$13\cdot593$	....
10	60	$2\cdot5\cdot751$	$2^3\cdot3^3\cdot5\cdot7$	$2\cdot5\cdot761$	$2^2\cdot5\cdot383$	$2\cdot3\cdot5\cdot257$	$2^4\cdot5\cdot97$
11	61	$7\cdot29\cdot37$	....	$3\cdot43\cdot59$	$47\cdot163$	$11\cdot701$	$3\cdot13\cdot199$
12	62	$2^3\cdot3\cdot313$	$2\cdot19\cdot199$	$2^2\cdot11\cdot173$	$2\cdot3\cdot1277$	$2^5\cdot241$	$2\cdot3881$
13	63	$11\cdot683$	$3\cdot2521$	$23\cdot331$	$79\cdot97$	$3^2\cdot857$	$7\cdot1109$
14	64	$2\cdot13\cdot17^2$	$2^2\cdot31\cdot61$	$2\cdot3^4\cdot47$	$2^4\cdot479$	$2\cdot7\cdot19\cdot29$	$2^2\cdot3\cdot647$
15	65	$3^2\cdot5\cdot167$	$5\cdot17\cdot89$	$5\cdot1523$	$3\cdot5\cdot7\cdot73$	$5\cdot1543$	$5\cdot1553$
16	66	$2^2\cdot1879$	$2\cdot3\cdot13\cdot97$	$2^6\cdot7\cdot17$	$2\cdot3833$	$2^2\cdot3\cdot643$	$2\cdot11\cdot353$
17	67	....	$7\cdot23\cdot47$	$3\cdot2539$	$11\cdot17\cdot41$	....	$3^2\cdot863$
18	68	$2\cdot3\cdot7\cdot179$	$2^4\cdot11\cdot43$	$2\cdot13\cdot293$	$2^2\cdot3^3\cdot71$	$2\cdot17\cdot227$	$2^3\cdot971$
19	69	$73\cdot103$	$3^2\cdot29^2$	$19\cdot401$	....	$3\cdot31\cdot83$	$17\cdot457$
20	70	$2^5\cdot5\cdot47$	$2\cdot5\cdot757$	$2^2\cdot3\cdot5\cdot127$	$2\cdot5\cdot13\cdot59$	$2^3\cdot5\cdot193$	$2\cdot3\cdot5\cdot7\cdot37$
21	71	$3\cdot23\cdot109$	$67\cdot113$	....	$3\cdot2557$	$7\cdot1103$	$19\cdot409$
22	72	$2\cdot3761$	$2^2\cdot3\cdot631$	$2\cdot37\cdot103$	$2^3\cdot7\cdot137$	$2\cdot3^3\cdot11\cdot13$	$2^2\cdot29\cdot67$
23	73	....	....	$3^2\cdot7\cdot11^2$	....	....	$3\cdot2591$
24	74	$2^2\cdot3^2\cdot11\cdot19$	$2\cdot7\cdot541$	$2^3\cdot953$	$2\cdot3\cdot1279$	$2^2\cdot1931$	$2\cdot13^2\cdot23$
25	75	$5^2\cdot7\cdot43$	$3\cdot5^2\cdot101$	$5^3\cdot61$	$5^2\cdot307$	$3\cdot5^2\cdot103$	$5^2\cdot311$
26	76	$2\cdot53\cdot71$	$2^3\cdot947$	$2\cdot3\cdot31\cdot41$	$2^2\cdot19\cdot101$	$2\cdot3863$	$2^5\cdot3^5$
27	77	$3\cdot13\cdot193$	....	$29\cdot263$	$3^2\cdot853$	....	$7\cdot11\cdot101$
28	78	$2^3\cdot941$	$2\cdot3^2\cdot421$	$2^2\cdot1907$	$2\cdot11\cdot349$	$2^4\cdot3\cdot7\cdot23$	$2\cdot3889$
29	79	....	$11\cdot13\cdot53$	$3\cdot2543$	$7\cdot1097$	$59\cdot131$	$3\cdot2593$
30	80	$2\cdot3\cdot5\cdot251$	$2^2\cdot5\cdot379$	$2\cdot5\cdot7\cdot109$	$2^9\cdot3\cdot5$	$2\cdot5\cdot773$	$2^2\cdot5\cdot389$
31	81	$17\cdot443$	$3\cdot7\cdot19^2$	$13\cdot587$	....	$3^2\cdot859$	$31\cdot251$
32	82	$2^2\cdot7\cdot269$	$2\cdot17\cdot223$	$2^4\cdot3^2\cdot53$	$2\cdot23\cdot167$	$2^2\cdot1933$	$2\cdot3\cdot1297$
33	83	$3^5\cdot31$	....	$17\cdot449$	$3\cdot13\cdot197$	$11\cdot19\cdot37$	$43\cdot181$
34	84	$2\cdot3767$	$2^5\cdot3\cdot79$	$2\cdot11\cdot347$	$2^2\cdot17\cdot113$	$2\cdot3\cdot1289$	$2^3\cdot7\cdot139$
35	85	$5\cdot11\cdot137$	$5\cdot37\cdot41$	$3\cdot5\cdot509$	$5\cdot29\cdot53$	$5\cdot7\cdot13\cdot17$	$3^2\cdot5\cdot173$
36	86	$2^4\cdot3\cdot157$	$2\cdot3793$	$2^2\cdot23\cdot83$	$2\cdot3^2\cdot7\cdot61$	$2^3\cdot967$	$2\cdot17\cdot229$
37	87	....	$3^3\cdot281$	$7\cdot1091$	....	$3\cdot2579$	$13\cdot599$
38	88	$2\cdot3769$	$2^2\cdot7\cdot271$	$2\cdot3\cdot19\cdot67$	$2^3\cdot31^2$	$2\cdot53\cdot73$	$2^2\cdot3\cdot11\cdot59$
39	89	$3\cdot7\cdot359$	....	....	$3\cdot11\cdot233$	$71\cdot109$	....
40	90	$2^2\cdot5\cdot13\cdot29$	$2\cdot3\cdot5\cdot11\cdot23$	$2^3\cdot5\cdot191$	$2\cdot5\cdot769$	$2^2\cdot3^2\cdot5\cdot43$	$2\cdot5\cdot19\cdot41$
41	91	....	....	$3^3\cdot283$	....	....	$3\cdot7^2\cdot53$
42	92	$2\cdot3^2\cdot419$	$2^3\cdot13\cdot73$	$2\cdot3821$	$2^2\cdot3\cdot641$	$2\cdot7^2\cdot79$	$2^4\cdot487$
43	93	$19\cdot397$	$3\cdot2531$	....	$7^2\cdot157$	$3\cdot29\cdot89$	....
44	94	$2^3\cdot23\cdot41$	$2\cdot3797$	$2^2\cdot3\cdot7^2\cdot13$	$2\cdot3847$	$2^6\cdot11^2$	$2\cdot3^2\cdot433$
45	95	$3\cdot5\cdot503$	$5\cdot7^2\cdot31$	$5\cdot11\cdot139$	$3^4\cdot5\cdot19$	$5\cdot1549$	$5\cdot1559$
46	96	$2\cdot7^3\cdot11$	$2^2\cdot3^2\cdot211$	$2\cdot3823$	$2^4\cdot13\cdot37$	$2\cdot3\cdot1291$	$2^2\cdot1949$
47	97	....	$71\cdot107$	$3\cdot2549$	$43\cdot179$	$61\cdot127$	$3\cdot23\cdot113$
48	98	$2^2\cdot3\cdot17\cdot37$	$2\cdot29\cdot131$	$2^5\cdot239$	$2\cdot3\cdot1283$	$2^2\cdot13\cdot149$	$2\cdot7\cdot557$
49	99	....	$3\cdot17\cdot149$	....	....	$3^3\cdot7\cdot41$	$11\cdot709$
50	100	$2\cdot5^2\cdot151$	$2^4\cdot5^2\cdot19$	$2\cdot3^2\cdot5^2\cdot17$	$2^2\cdot5^2\cdot7\cdot11$	$2\cdot5^3\cdot31$	$2^3\cdot3\cdot5^2\cdot13$

From		7800	7850	7900	7950	8000	8050
To		**7850**	**7900**	**7950**	**8000**	**8050**	**8100**
0	50	$2^3\cdot3\cdot5^2\cdot13$	$2\cdot5^2\cdot157$	$2^2\cdot5^2\cdot79$	$2\cdot3\cdot5^2\cdot53$	$2^6\cdot5^3$	$2\cdot5^2\cdot7\cdot23$
1	51	$29\cdot269$	$3\cdot2617$	....	....	$3^2\cdot7\cdot127$	$83\cdot97$
2	52	$2\cdot47\cdot83$	$2^2\cdot13\cdot151$	$2\cdot3^2\cdot439$	$2^4\cdot7\cdot71$	$2\cdot4001$	$2^2\cdot3\cdot11\cdot61$
3	53	$3^3\cdot17^2$	....	$7\cdot1129$	$3\cdot11\cdot241$	$53\cdot151$	....
4	54	$2^2\cdot1951$	$2\cdot3\cdot7\cdot11\cdot17$	$2^5\cdot13\cdot19$	$2\cdot41\cdot97$	$2^2\cdot3\cdot23\cdot29$	$2\cdot4027$
5	55	$5\cdot7\cdot223$	$5\cdot1571$	$3\cdot5\cdot17\cdot31$	$5\cdot37\cdot43$	$5\cdot1601$	$3^2\cdot5\cdot179$
6	56	$2\cdot3\cdot1301$	$2^4\cdot491$	$2\cdot59\cdot67$	$2^2\cdot3^2\cdot13\cdot17$	$2\cdot4003$	$2^3\cdot19\cdot53$
7	57	$37\cdot211$	$3^4\cdot97$	....	$73\cdot109$	$3\cdot17\cdot157$	$7\cdot1151$
8	58	$2^7\cdot61$	$2\cdot3929$	$2^2\cdot3\cdot659$	$2\cdot23\cdot173$	$2^3\cdot7\cdot11\cdot13$	$2\cdot3\cdot17\cdot79$
9	59	$3\cdot19\cdot137$	$29\cdot271$	$11\cdot719$	$3\cdot7\cdot379$	....	....
10	60	$2\cdot5\cdot11\cdot71$	$2^2\cdot3\cdot5\cdot131$	$2\cdot5\cdot7\cdot113$	$2^3\cdot5\cdot199$	$2\cdot3^2\cdot5\cdot89$	$2^2\cdot5\cdot13\cdot31$
11	61	$73\cdot107$	$7\cdot1123$	$3^3\cdot293$	$19\cdot419$	....	$3\cdot2687$
12	62	$2^2\cdot3^2\cdot7\cdot31$	$2\cdot3931$	$2^3\cdot23\cdot43$	$2\cdot3\cdot1327$	$2^2\cdot2003$	$2\cdot29\cdot139$
13	63	$13\cdot601$	$3\cdot2621$	$41\cdot193$	....	$3\cdot2671$	$11\cdot733$
14	64	$2\cdot3907$	$2^3\cdot983$	$2\cdot3\cdot1319$	$2^2\cdot11\cdot181$	$2\cdot4007$	$2^7\cdot3^2\cdot7$
15	65	$3\cdot5\cdot521$	$5\cdot11^2\cdot13$	$5\cdot1583$	$3^3\cdot5\cdot59$	$5\cdot7\cdot229$	$5\cdot1613$
16	66	$2^3\cdot977$	$2\cdot3^2\cdot19\cdot23$	$2^2\cdot1979$	$2\cdot7\cdot569$	$2^4\cdot3\cdot167$	$2\cdot37\cdot109$
17	67	....	....	$3\cdot7\cdot13\cdot29$	$31\cdot257$	....	$3\cdot2689$
18	68	$2\cdot3\cdot1303$	$2^2\cdot7\cdot281$	$2\cdot37\cdot107$	$2^5\cdot3\cdot83$	$2\cdot19\cdot211$	$2^2\cdot2017$
19	69	$7\cdot1117$	$3\cdot43\cdot61$	....	$13\cdot613$	$3^6\cdot11$	....
20	70	$2^2\cdot5\cdot17\cdot23$	$2\cdot5\cdot787$	$2^4\cdot3^2\cdot5\cdot11$	$2\cdot5\cdot797$	$2^2\cdot5\cdot401$	$2\cdot3\cdot5\cdot269$
21	71	$3^2\cdot11\cdot79$	$17\cdot463$	89^2	$3\cdot2657$	$13\cdot617$	$7\cdot1153$
22	72	$2\cdot3911$	$2^6\cdot3\cdot41$	$2\cdot17\cdot233$	$2^2\cdot1993$	$2\cdot3\cdot7\cdot191$	$2^3\cdot1009$
23	73	....	....	$3\cdot19\cdot139$	$7\cdot17\cdot67$	$71\cdot113$	$3^3\cdot13\cdot23$
24	74	$2^4\cdot3\cdot163$	$2\cdot31\cdot127$	$2^2\cdot7\cdot283$	$2\cdot3^2\cdot443$	$2^3\cdot17\cdot59$	$2\cdot11\cdot367$
25	75	$5^2\cdot313$	$3^2\cdot5^3\cdot7$	$5^2\cdot317$	$5^2\cdot11\cdot29$	$3\cdot5^2\cdot107$	$5^2\cdot17\cdot19$
26	76	$2\cdot7\cdot13\cdot43$	$2^2\cdot11\cdot179$	$2\cdot3\cdot1321$	$2^3\cdot997$	$2\cdot4013$	$2^2\cdot3\cdot673$
27	77	$3\cdot2609$	....	....	$3\cdot2659$	$23\cdot349$	$41\cdot197$
28	78	$2^2\cdot19\cdot103$	$2\cdot3\cdot13\cdot101$	$2^3\cdot991$	$2\cdot3989$	$2^2\cdot3^2\cdot223$	$2\cdot7\cdot577$
29	79	....	....	$3^2\cdot881$	$79\cdot101$	$7\cdot31\cdot37$	$3\cdot2693$
30	80	$2\cdot3^3\cdot5\cdot29$	$2^3\cdot5\cdot197$	$2\cdot5\cdot13\cdot61$	$2^2\cdot3\cdot5\cdot7\cdot19$	$2\cdot5\cdot11\cdot73$	$2^4\cdot5\cdot101$
31	81	$41\cdot191$	$3\cdot37\cdot71$	$7\cdot11\cdot103$	$23\cdot347$	$3\cdot2677$	....
32	82	$2^3\cdot11\cdot89$	$2\cdot7\cdot563$	$2^2\cdot3\cdot661$	$2\cdot13\cdot307$	$2^5\cdot251$	$2\cdot3^2\cdot449$
33	83	$3\cdot7\cdot373$	....	....	$3^2\cdot887$	$29\cdot277$	$59\cdot137$
34	84	$2\cdot3917$	$2^2\cdot3^3\cdot73$	$2\cdot3967$	$2^4\cdot499$	$2\cdot3\cdot13\cdot103$	$2^2\cdot43\cdot47$
35	85	$5\cdot1567$	$5\cdot19\cdot83$	$3\cdot5\cdot23^2$	$5\cdot1597$	$5\cdot1607$	$3\cdot5\cdot7^2\cdot11$
36	86	$2^2\cdot3\cdot653$	$2\cdot3943$	$2^8\cdot31$	$2\cdot3\cdot11^3$	$2^2\cdot7^2\cdot41$	$2\cdot13\cdot311$
37	87	$17\cdot461$	$3\cdot11\cdot239$	....	$7^2\cdot163$	$3^2\cdot19\cdot47$	....
38	88	$2\cdot3919$	$2^4\cdot17\cdot29$	$2\cdot3^4\cdot7^2$	$2^2\cdot1997$	$2\cdot4019$	$2^3\cdot3\cdot337$
39	89	$3^2\cdot13\cdot67$	$7^3\cdot23$	$17\cdot467$	$3\cdot2663$	....	....
40	90	$2^5\cdot5\cdot7^2$	$2\cdot3\cdot5\cdot263$	$2^2\cdot5\cdot397$	$2\cdot5\cdot17\cdot47$	$2^3\cdot3\cdot5\cdot67$	$2\cdot5\cdot809$
41	91	....	$13\cdot607$	$3\cdot2647$	$61\cdot131$	$11\cdot17\cdot43$	$3^2\cdot29\cdot31$
42	92	$2\cdot3\cdot1307$	$2^2\cdot1973$	$2\cdot11\cdot19^2$	$2^3\cdot3^3\cdot37$	$2\cdot4021$	$2^2\cdot7\cdot17^2$
43	93	$11\cdot23\cdot31$	$3^2\cdot877$	$13^2\cdot47$	....	$3\cdot7\cdot383$	....
44	94	$2^2\cdot37\cdot53$	$2\cdot3947$	$2^3\cdot3\cdot331$	$2\cdot7\cdot571$	$2^2\cdot2011$	$2\cdot3\cdot19\cdot71$
45	95	$3\cdot5\cdot523$	$5\cdot1579$	$5\cdot7\cdot227$	$3\cdot5\cdot13\cdot41$	$5\cdot1609$	$5\cdot1619$
46	96	$2\cdot3923$	$2^3\cdot3\cdot7\cdot47$	$2\cdot29\cdot137$	$2^2\cdot1999$	$2\cdot3^3\cdot149$	$2^5\cdot11\cdot23$
47	97	$7\cdot19\cdot59$	$53\cdot149$	$3^2\cdot883$	$11\cdot727$	$13\cdot619$	$3\cdot2699$
48	98	$2^3\cdot3^2\cdot109$	$2\cdot11\cdot359$	$2^2\cdot1987$	$2\cdot3\cdot31\cdot43$	$2^4\cdot503$	$2\cdot4049$
49	99	$47\cdot167$	$3\cdot2633$	....	$19\cdot421$	$3\cdot2683$	$7\cdot13\cdot89$
50	100	$2\cdot5^2\cdot157$	$2^2\cdot5^2\cdot79$	$2\cdot3\cdot5^2\cdot53$	$2^6\cdot5^3$	$2\cdot5^2\cdot7\cdot23$	$2^2\cdot3^4\cdot5^2$

From		8100	8150	8200	8250	8300	8350
To		8150	8200	8250	8300	8350	8400
0	50	$2^2 \cdot 3^4 \cdot 5^2$	$2 \cdot 5^2 \cdot 163$	$2^3 \cdot 5^2 \cdot 41$	$2 \cdot 3 \cdot 5^3 \cdot 11$	$2^2 \cdot 5^2 \cdot 83$	$2 \cdot 5^2 \cdot 167$
1	51	....	$3 \cdot 11 \cdot 13 \cdot 19$	$59 \cdot 139$	$37 \cdot 223$	$3 \cdot 2767$	$7 \cdot 1193$
2	52	$2 \cdot 4051$	$2^3 \cdot 1019$	$2 \cdot 3 \cdot 1367$	$2^2 \cdot 2063$	$2 \cdot 7 \cdot 593$	$2^5 \cdot 3^2 \cdot 29$
3	53	$3 \cdot 37 \cdot 73$	$31 \cdot 263$	$13 \cdot 631$	$3^2 \cdot 7 \cdot 131$	$19^2 \cdot 23$	....
4	54	$2^3 \cdot 1013$	$2 \cdot 3^3 \cdot 151$	$2^2 \cdot 7 \cdot 293$	$2 \cdot 4127$	$2^4 \cdot 3 \cdot 173$	$2 \cdot 4177$
5	55	$5 \cdot 1621$	$5 \cdot 7 \cdot 233$	$3 \cdot 5 \cdot 547$	$5 \cdot 13 \cdot 127$	$5 \cdot 11 \cdot 151$	$3 \cdot 5 \cdot 557$
6	56	$2 \cdot 3 \cdot 7 \cdot 193$	$2^2 \cdot 2039$	$2 \cdot 11 \cdot 373$	$2^6 \cdot 3 \cdot 43$	$2 \cdot 4153$	$2^2 \cdot 2089$
7	57	$11^2 \cdot 67$	$3 \cdot 2719$	$29 \cdot 283$	$23 \cdot 359$	$3^2 \cdot 13 \cdot 71$	$61 \cdot 137$
8	58	$2^2 \cdot 2027$	$2 \cdot 4079$	$2^4 \cdot 3^3 \cdot 19$	$2 \cdot 4129$	$2^2 \cdot 31 \cdot 67$	$2 \cdot 3 \cdot 7 \cdot 199$
9	59	$3^2 \cdot 17 \cdot 53$	$41 \cdot 199$	....	$3 \cdot 2753$	$7 \cdot 1187$	$13 \cdot 643$
10	60	$2 \cdot 5 \cdot 811$	$2^5 \cdot 3 \cdot 5 \cdot 17$	$2 \cdot 5 \cdot 821$	$2^2 \cdot 5 \cdot 7 \cdot 59$	$2 \cdot 3 \cdot 5 \cdot 277$	$2^3 \cdot 5 \cdot 11 \cdot 19$
11	61	....	....	$3 \cdot 7 \cdot 17 \cdot 23$	$11 \cdot 751$	....	$3^2 \cdot 929$
12	62	$2^4 \cdot 3 \cdot 13^2$	$2 \cdot 7 \cdot 11 \cdot 53$	$2^2 \cdot 2053$	$2 \cdot 3^5 \cdot 17$	$2^3 \cdot 1039$	$2 \cdot 37 \cdot 113$
13	63	$7 \cdot 19 \cdot 61$	$3^2 \cdot 907$	$43 \cdot 191$	....	$3 \cdot 17 \cdot 163$	....
14	64	$2 \cdot 4057$	$2^2 \cdot 13 \cdot 157$	$2 \cdot 3 \cdot 37^2$	$2^3 \cdot 1033$	$2 \cdot 4157$	$2^2 \cdot 3 \cdot 17 \cdot 41$
15	65	$3 \cdot 5 \cdot 541$	$5 \cdot 23 \cdot 71$	$5 \cdot 31 \cdot 53$	$3 \cdot 5 \cdot 19 \cdot 29$	$5 \cdot 1663$	$5 \cdot 7 \cdot 239$
16	66	$2^2 \cdot 2029$	$2 \cdot 3 \cdot 1361$	$2^3 \cdot 13 \cdot 79$	$2 \cdot 4133$	$2^2 \cdot 3^3 \cdot 7 \cdot 11$	$2 \cdot 47 \cdot 89$
17	67	....	....	$3^2 \cdot 11 \cdot 83$	$7 \cdot 1181$	....	$3 \cdot 2789$
18	68	$2 \cdot 3^2 \cdot 11 \cdot 41$	$2^3 \cdot 1021$	$2 \cdot 7 \cdot 587$	$2^2 \cdot 3 \cdot 13 \cdot 53$	$2 \cdot 4159$	$2^4 \cdot 523$
19	69	$23 \cdot 353$	$3 \cdot 7 \cdot 389$	....	....	$3 \cdot 47 \cdot 59$	....
20	70	$2^3 \cdot 5 \cdot 7 \cdot 29$	$2 \cdot 5 \cdot 19 \cdot 43$	$2^2 \cdot 3 \cdot 5 \cdot 137$	$2 \cdot 5 \cdot 827$	$2^7 \cdot 5 \cdot 13$	$2 \cdot 3^3 \cdot 5 \cdot 31$
21	71	$3 \cdot 2707$	....	....	$3^2 \cdot 919$	$53 \cdot 157$	$11 \cdot 761$
22	72	$2 \cdot 31 \cdot 131$	$2^2 \cdot 3^3 \cdot 227$	$2 \cdot 4111$	$2^4 \cdot 11 \cdot 47$	$2 \cdot 3 \cdot 19 \cdot 73$	$2^2 \cdot 7 \cdot 13 \cdot 23$
23	73	....	$11 \cdot 743$	$3 \cdot 2741$	....	$7 \cdot 29 \cdot 41$	$3 \cdot 2791$
24	74	$2^2 \cdot 3 \cdot 677$	$2 \cdot 61 \cdot 67$	$2^5 \cdot 257$	$2 \cdot 3 \cdot 7 \cdot 197$	$2^2 \cdot 2081$	$2 \cdot 53 \cdot 79$
25	75	$5^4 \cdot 13$	$3 \cdot 5^2 \cdot 109$	$5^2 \cdot 7 \cdot 47$	$5^2 \cdot 331$	$3^2 \cdot 5^2 \cdot 37$	$5^3 \cdot 67$
26	76	$2 \cdot 17 \cdot 239$	$2^4 \cdot 7 \cdot 73$	$2 \cdot 3^2 \cdot 457$	$2^2 \cdot 2069$	$2 \cdot 23 \cdot 181$	$2^3 \cdot 3 \cdot 349$
27	77	$3^3 \cdot 7 \cdot 43$	$13 \cdot 17 \cdot 37$	$19 \cdot 433$	$3 \cdot 31 \cdot 89$	$11 \cdot 757$	....
28	78	$2^6 \cdot 127$	$2 \cdot 3 \cdot 29 \cdot 47$	$2^2 \cdot 11^2 \cdot 17$	$2 \cdot 4139$	$2^3 \cdot 3 \cdot 347$	$2 \cdot 59 \cdot 71$
29	79	$11 \cdot 739$	....	$3 \cdot 13 \cdot 211$	$17 \cdot 487$	....	$3^2 \cdot 7^2 \cdot 19$
30	80	$2 \cdot 3 \cdot 5 \cdot 271$	$2^2 \cdot 5 \cdot 409$	$2 \cdot 5 \cdot 823$	$2^3 \cdot 3^2 \cdot 5 \cdot 23$	$2 \cdot 5 \cdot 7^2 \cdot 17$	$2^2 \cdot 5 \cdot 419$
31	81	$47 \cdot 173$	$3^4 \cdot 101$	....	$7^2 \cdot 13^2$	$3 \cdot 2777$	$17^2 \cdot 29$
32	82	$2^2 \cdot 19 \cdot 107$	$2 \cdot 4091$	$2^3 \cdot 3 \cdot 7^3$	$2 \cdot 41 \cdot 101$	$2^2 \cdot 2083$	$2 \cdot 3 \cdot 11 \cdot 127$
33	83	$3 \cdot 2711$	$7^2 \cdot 167$	....	$3 \cdot 11 \cdot 251$	$13 \cdot 641$	$83 \cdot 101$
34	84	$2 \cdot 7^2 \cdot 83$	$2^3 \cdot 3 \cdot 11 \cdot 31$	$2 \cdot 23 \cdot 179$	$2^2 \cdot 19 \cdot 109$	$2 \cdot 3^2 \cdot 463$	$2^6 \cdot 131$
35	85	$5 \cdot 1627$	$5 \cdot 1637$	$3^3 \cdot 5 \cdot 61$	$5^2 \cdot 331$	$5 \cdot 1667$	$3 \cdot 5 \cdot 13 \cdot 43$
36	86	$2^3 \cdot 3^2 \cdot 113$	$2 \cdot 4093$	$2^2 \cdot 29 \cdot 71$	$2 \cdot 3 \cdot 1381$	$2^4 \cdot 521$	$2 \cdot 7 \cdot 599$
37	87	$79 \cdot 103$	$3 \cdot 2729$	....	....	$3 \cdot 7 \cdot 397$	....
38	88	$2 \cdot 13 \cdot 313$	$2^2 \cdot 23 \cdot 89$	$2 \cdot 3 \cdot 1373$	$2^5 \cdot 7 \cdot 37$	$2 \cdot 11 \cdot 379$	$2^2 \cdot 3^2 \cdot 233$
39	89	$3 \cdot 2713$	$19 \cdot 431$	$7 \cdot 11 \cdot 107$	$3^3 \cdot 307$	$31 \cdot 269$	....
40	90	$2^2 \cdot 5 \cdot 11 \cdot 37$	$2 \cdot 3^2 \cdot 5 \cdot 7 \cdot 13$	$2^4 \cdot 5 \cdot 103$	$2 \cdot 5 \cdot 829$	$2^2 \cdot 3 \cdot 5 \cdot 139$	$2 \cdot 5 \cdot 839$
41	91	$7 \cdot 1163$	....	$3 \cdot 41 \cdot 67$	....	$19 \cdot 439$	$3 \cdot 2797$
42	92	$2 \cdot 3 \cdot 23 \cdot 59$	2^{13}	$2 \cdot 13 \cdot 317$	$2^2 \cdot 3 \cdot 691$	$2 \cdot 43 \cdot 97$	$2^3 \cdot 1049$
43	93	$17 \cdot 479$	$3 \cdot 2731$	....	....	$3^4 \cdot 103$	$7 \cdot 11 \cdot 109$
44	94	$2^4 \cdot 509$	$2 \cdot 17 \cdot 241$	$2^2 \cdot 3^2 \cdot 229$	$2 \cdot 11 \cdot 13 \cdot 29$	$2^3 \cdot 7 \cdot 149$	$2 \cdot 3 \cdot 1399$
45	95	$3^2 \cdot 5 \cdot 181$	$5 \cdot 11 \cdot 149$	$5 \cdot 17 \cdot 97$	$3 \cdot 5 \cdot 7 \cdot 79$	$5 \cdot 1669$	$5 \cdot 23 \cdot 73$
46	96	$2 \cdot 4073$	$2^2 \cdot 3 \cdot 683$	$2 \cdot 7 \cdot 19 \cdot 31$	$2^3 \cdot 17 \cdot 61$	$2 \cdot 3 \cdot 13 \cdot 107$	$2^2 \cdot 2099$
47	97	....	$7 \cdot 1171$	$3 \cdot 2749$	....	$17 \cdot 491$	$3^3 \cdot 311$
48	98	$2^2 \cdot 3 \cdot 7 \cdot 97$	$2 \cdot 4099$	$2^3 \cdot 1031$	$2 \cdot 3^2 \cdot 461$	$2^2 \cdot 2087$	$2 \cdot 13 \cdot 17 \cdot 19$
49	99	$29 \cdot 281$	$3^2 \cdot 911$	$73 \cdot 113$	$43 \cdot 193$	$3 \cdot 11^2 \cdot 23$	$37 \cdot 227$
50	100	$2 \cdot 5^2 \cdot 163$	$2^3 \cdot 5^2 \cdot 41$	$2 \cdot 3 \cdot 5^3 \cdot 11$	$2^2 \cdot 5^2 \cdot 83$	$2 \cdot 5^2 \cdot 167$	$2^4 \cdot 3 \cdot 5^2 \cdot 7$

From		8400	8450	8500	8550	8600	8650
To		8450	8500	8550	8600	8650	8700
0	50	$2^4\cdot3\cdot5^2\cdot7$	$2\cdot5^2\cdot13^2$	$2^2\cdot5^3\cdot17$	$2\cdot3^2\cdot5^2\cdot19$	$2^3\cdot5^2\cdot43$	$2\cdot5^2\cdot173$
1	51	31·271	$3^3\cdot313$	....	17·503	3·47·61	41·211
2	52	2·4201	$2^2\cdot2113$	2·3·13·109	$2^3\cdot1069$	2·11·17·23	$2^2\cdot3\cdot7\cdot103$
3	53	3·2801	79·107	11·773	3·2851	7·1229	17·509
4	54	$2^2\cdot11\cdot191$	2·3·1409	$2^3\cdot1063$	2·7·13·47	$2^2\cdot3^2\cdot239$	2·4327
5	55	$5\cdot41^2$	5·19·89	$3^5\cdot5\cdot7$	5·29·59	5·1721	3·5·577
6	56	$2\cdot3^2\cdot467$	$2^3\cdot7\cdot151$	2·4253	$2^2\cdot3\cdot23\cdot31$	2·13·331	$2^4\cdot541$
7	57	7·1201	3·2819	47·181	43·199	3·19·151	11·787
8	58	$2^3\cdot1051$	2·4229	$2^2\cdot3\cdot709$	2·11·389	$2^5\cdot269$	$2\cdot3^2\cdot13\cdot37$
9	59	3·2803	11·769	67·127	$3^3\cdot317$	....	7·1237
10	60	$2\cdot5\cdot29^2$	$2^2\cdot3^2\cdot5\cdot47$	2·5·23·37	$2^4\cdot5\cdot107$	2·3·5·7·41	$2^2\cdot5\cdot433$
11	61	13·647	....	3·2837	7·1223	79·109	3·2887
12	62	$2^2\cdot3\cdot701$	2·4231	$2^6\cdot7\cdot19$	2·3·1427	$2^2\cdot2153$	2·61·71
13	63	47·179	3·7·13·31	....	....	$3^3\cdot11\cdot29$	....
14	64	2·7·601	$2^4\cdot23^2$	$2\cdot3^2\cdot11\cdot43$	$2^2\cdot2141$	2·59·73	$2^3\cdot3\cdot19^2$
15	65	$3^2\cdot5\cdot11\cdot17$	5·1693	5·13·131	3·5·571	5·1723	5·1733
16	66	$2^5\cdot263$	2·3·17·83	$2^2\cdot2129$	2·4283	$2^3\cdot3\cdot359$	2·7·619
17	67	19·443	....	3·17·167	13·659	7·1231	$3^4\cdot107$
18	68	2·3·23·61	$2^2\cdot29\cdot73$	2·4259	$2^3\cdot3^2\cdot7\cdot17$	2·31·139	$2^2\cdot11\cdot197$
19	69	....	$3^2\cdot941$	7·1217	11·19·41	$3\cdot13^2\cdot17$	....
20	70	$2^2\cdot5\cdot421$	$2\cdot5\cdot7\cdot11^2$	$2^3\cdot3\cdot5\cdot71$	2·5·857	$2^2\cdot5\cdot431$	$2\cdot3\cdot5\cdot17^2$
21	71	3·7·401	43·197	....	3·2857	37·233	13·23·29
22	72	2·4211	$2^3\cdot3\cdot353$	2·4261	$2^2\cdot2143$	$2\cdot3^2\cdot479$	$2^5\cdot271$
23	73	....	37·229	$3^2\cdot947$	....	....	$3\cdot7^2\cdot59$
24	74	$2^3\cdot3^4\cdot13$	2·19·223	$2^2\cdot2131$	2·3·1429	$2^4\cdot7^2\cdot11$	2·4337
25	75	$5^2\cdot337$	$3\cdot5^2\cdot113$	$5^2\cdot11\cdot31$	$5^2\cdot7^3$	$3\cdot5^3\cdot23$	$5^2\cdot347$
26	76	2·11·383	$2^2\cdot13\cdot163$	$2\cdot3\cdot7^2\cdot29$	$2^7\cdot67$	2·19·227	$2^2\cdot3^2\cdot241$
27	77	$3\cdot53^2$	$7^2\cdot173$	....	$3^2\cdot953$	....	....
28	78	$2^2\cdot7^2\cdot43$	$2\cdot3^3\cdot157$	$2^4\cdot13\cdot41$	2·4289	$2^2\cdot3\cdot719$	2·4339
29	79	....	61·139	3·2843	23·373	....	3·11·263
30	80	2·3·5·281	$2^5\cdot5\cdot53$	2·5·853	$2^2\cdot3\cdot5\cdot11\cdot13$	2·5·863	$2^3\cdot5\cdot7\cdot31$
31	81	....	3·11·257	19·449	....	$3^2\cdot7\cdot137$	....
32	82	$2^4\cdot17\cdot31$	2·4241	$2^2\cdot3^3\cdot79$	2·7·613	$2^3\cdot13\cdot83$	2·3·1447
33	83	$3^2\cdot937$	17·499	7·23·53	3·2861	89·97	19·457
34	84	2·4217	$2^2\cdot3\cdot7\cdot101$	2·17·251	$2^3\cdot29\cdot37$	2·3·1439	$2^2\cdot13\cdot167$
35	85	5·7·241	5·1697	3·5·569	5·17·101	5·11·157	$3^2\cdot5\cdot193$
36	86	$2^2\cdot3\cdot19\cdot37$	2·4243	$2^3\cdot11\cdot97$	$2\cdot3^4\cdot53$	$2^2\cdot17\cdot127$	2·43·101
37	87	11·13·59	$3^2\cdot23\cdot41$	....	31·277	3·2879	7·17·73
38	88	2·4219	$2^3\cdot1061$	2·3·1423	$2^2\cdot19\cdot113$	2·7·617	$2^4\cdot3\cdot181$
39	89	3·29·97	13·653	....	3·7·409	53·163	....
40	90	$2^3\cdot5\cdot211$	2·3·5·283	$2^2\cdot5\cdot7\cdot61$	2·5·859	$2^6\cdot3^3\cdot5$	2·5·11·79
41	91	23·367	7·1213	$3^2\cdot13\cdot73$	$11^2\cdot71$	....	3·2897
42	92	$2\cdot3^2\cdot7\cdot67$	$2^2\cdot11\cdot193$	2·4271	$2^4\cdot3\cdot179$	2·29·149	$2^2\cdot41\cdot53$
43	93	....	3·19·149	....	13·661	3·43·67	....
44	94	$2^2\cdot2111$	2·31·137	$2^5\cdot3\cdot89$	2·4297	$2^2\cdot2161$	$2\cdot3^3\cdot7\cdot23$
45	95	3·5·563	5·1699	5·1709	$3^2\cdot5\cdot191$	5·7·13·19	5·37·47
46	96	2·41·103	$2^4\cdot3^2\cdot59$	2·4273	$2^2\cdot7\cdot307$	2·3·11·131	$2^3\cdot1087$
47	97	....	29·293	3·7·11·37	....	....	3·13·223
48	98	$2^8\cdot3\cdot11$	2·7·607	$2^2\cdot2137$	2·3·1433	$2^3\cdot23\cdot47$	2·4349
49	99	7·17·71	3·2833	83·103	....	$3^2\cdot31^2$	....
50	100	$2\cdot5^2\cdot13^2$	$2^2\cdot5^3\cdot17$	$2\cdot3^2\cdot5^2\cdot19$	$2^3\cdot5^2\cdot43$	$2\cdot5^2\cdot173$	$2^2\cdot3\cdot5^2\cdot29$

From		8700	8750	8800	8850	8900	8950
To		8750	8800	8850	8900	8950	9000
0	50	$2^2\cdot3\cdot5^2\cdot29$	$2\cdot5^4\cdot7$	$2^5\cdot5^2\cdot11$	$2\cdot3\cdot5^2\cdot59$	$2^2\cdot5^2\cdot89$	$2\cdot5^2\cdot179$
1	51	$7\cdot11\cdot113$	$3\cdot2917$	$13\cdot677$	$53\cdot167$	$3^3\cdot23\cdot43$	....
2	52	$2\cdot19\cdot229$	$2^4\cdot547$	$2\cdot3^3\cdot163$	$2^2\cdot2213$	$2\cdot4451$	$2^3\cdot3\cdot373$
3	53	$3^2\cdot967$	....	....	$3\cdot13\cdot227$	$29\cdot307$	$7\cdot1279$
4	54	$2^9\cdot17$	$2\cdot3\cdot1459$	$2^2\cdot31\cdot71$	$2\cdot19\cdot233$	$2^3\cdot3\cdot7\cdot53$	$2\cdot11^2\cdot37$
5	55	$5\cdot1741$	$5\cdot17\cdot103$	$3\cdot5\cdot587$	$5\cdot7\cdot11\cdot23$	$5\cdot13\cdot137$	$3^2\cdot5\cdot199$
6	56	$2\cdot3\cdot1451$	$2^2\cdot11\cdot199$	$2\cdot7\cdot17\cdot37$	$2^3\cdot3^3\cdot41$	$2\cdot61\cdot73$	$2^2\cdot2239$
7	57	....	$3^2\cdot7\cdot139$	....	$17\cdot521$	$3\cdot2969$	$13^2\cdot53$
8	58	$2^2\cdot7\cdot311$	$2\cdot29\cdot151$	$2^3\cdot3\cdot367$	$2\cdot43\cdot103$	$2^2\cdot17\cdot131$	$2\cdot3\cdot1493$
9	59	$3\cdot2903$	$19\cdot461$	$23\cdot383$	$3\cdot2953$	$59\cdot151$	$17^2\cdot31$
10	60	$2\cdot5\cdot13\cdot67$	$2^3\cdot3\cdot5\cdot73$	$2\cdot5\cdot881$	$2^2\cdot5\cdot443$	$2\cdot3^4\cdot5\cdot11$	$2^8\cdot5\cdot7$
11	61	$31\cdot281$	....	$3^2\cdot11\cdot89$	....	$7\cdot19\cdot67$	$3\cdot29\cdot103$
12	62	$2^3\cdot3^2\cdot11^2$	$2\cdot13\cdot337$	$2^2\cdot2203$	$2\cdot3\cdot7\cdot211$	$2^4\cdot557$	$2\cdot4481$
13	63	....	$3\cdot23\cdot127$	$7\cdot1259$	....	$3\cdot2971$	....
14	64	$2\cdot4357$	$2^2\cdot7\cdot313$	$2\cdot3\cdot13\cdot113$	$2^5\cdot277$	$2\cdot4457$	$2^2\cdot3^3\cdot83$
15	65	$3\cdot5\cdot7\cdot83$	$5\cdot1753$	$5\cdot43\cdot41$	$3^2\cdot5\cdot197$	$5\cdot1783$	$5\cdot11\cdot163$
16	66	$2^2\cdot2179$	$2\cdot3^2\cdot487$	$2^4\cdot19\cdot29$	$2\cdot11\cdot13\cdot31$	$2^2\cdot3\cdot743$	$2\cdot4483$
17	67	$23\cdot379$	$11\cdot797$	$3\cdot2939$	....	$37\cdot241$	$3\cdot7^2\cdot61$
18	68	$2\cdot3\cdot1453$	$2^6\cdot137$	$2\cdot4409$	$2^2\cdot3\cdot739$	$2\cdot7^3\cdot13$	$2^3\cdot19\cdot59$
19	69	....	$3\cdot37\cdot79$	....	$7^2\cdot181$	$3^2\cdot991$	....
20	70	$2^4\cdot5\cdot109$	$2\cdot5\cdot877$	$2^2\cdot3^2\cdot5\cdot7^2$	$2\cdot5\cdot887$	$2^3\cdot5\cdot223$	$2\cdot3\cdot5\cdot13\cdot23$
21	71	$3^3\cdot17\cdot19$	$7^2\cdot179$	....	$3\cdot2957$	$11\cdot811$	....
22	72	$2\cdot7^2\cdot89$	$2^2\cdot3\cdot17\cdot43$	$2\cdot11\cdot401$	$2^3\cdot1109$	$2\cdot3\cdot1487$	$2^2\cdot2243$
23	73	$11\cdot13\cdot61$	$31\cdot283$	$3\cdot17\cdot173$	$19\cdot467$	....	$3^2\cdot997$
24	74	$2^2\cdot3\cdot727$	$2\cdot41\cdot107$	$2^3\cdot1103$	$2\cdot3^2\cdot17\cdot29$	$2^2\cdot23\cdot97$	$2\cdot7\cdot641$
25	75	$5^2\cdot349$	$3^3\cdot5^2\cdot13$	$5^2\cdot353$	$5^3\cdot71$	$3\cdot5^2\cdot7\cdot17$	$5^2\cdot359$
26	76	$2\cdot4363$	$2^3\cdot1097$	$2\cdot3\cdot1471$	$2^2\cdot7\cdot317$	$2\cdot4463$	$2^4\cdot3\cdot11\cdot17$
27	77	$3\cdot2909$	$67\cdot131$	$7\cdot13\cdot97$	$3\cdot11\cdot269$	$79\cdot113$	$47\cdot191$
28	78	$2^3\cdot1091$	$2\cdot3\cdot7\cdot11\cdot19$	$2^2\cdot2207$	$2\cdot23\cdot193$	$2^5\cdot3^2\cdot31$	$2\cdot67^2$
29	79	$7\cdot29\cdot43$	....	$3^4\cdot109$	$13\cdot683$	....	$3\cdot41\cdot73$
30	80	$2\cdot3^2\cdot5\cdot97$	$2^2\cdot5\cdot439$	$2\cdot5\cdot883$	$2^4\cdot3\cdot5\cdot37$	$2\cdot5\cdot19\cdot47$	$2^2\cdot5\cdot449$
31	81	....	$3\cdot2927$	....	$83\cdot107$	$3\cdot13\cdot229$	$7\cdot1283$
32	82	$2^2\cdot37\cdot59$	$2\cdot4391$	$2^7\cdot3\cdot23$	$2\cdot4441$	$2^2\cdot7\cdot11\cdot29$	$2\cdot3^2\cdot499$
33	83	$3\cdot41\cdot71$	....	$11^2\cdot73$	$3^3\cdot7\cdot47$	....	$13\cdot691$
34	84	$2\cdot11\cdot397$	$2^4\cdot3^2\cdot61$	$2\cdot7\cdot631$	$2^2\cdot2221$	$2\cdot3\cdot1489$	$2^3\cdot1123$
35	85	$5\cdot1747$	$5\cdot7\cdot251$	$3\cdot5\cdot19\cdot31$	$5\cdot1777$	$5\cdot1787$	$3\cdot5\cdot599$
36	86	$2^5\cdot3\cdot7\cdot13$	$2\cdot23\cdot191$	$2^2\cdot47^2$	$2\cdot3\cdot1481$	$2^3\cdot1117$	$2\cdot4493$
37	87	....	$3\cdot29\cdot101$	....	....	$3^3\cdot331$	$11\cdot19\cdot43$
38	88	$2\cdot17\cdot257$	$2^2\cdot13^3$	$2\cdot3^2\cdot491$	$2^3\cdot11\cdot101$	$2\cdot41\cdot109$	$2^2\cdot3\cdot7\cdot107$
39	89	$3^2\cdot971$	$11\cdot17\cdot47$	....	$3\cdot2963$	$7\cdot1277$	$89\cdot101$
40	90	$2^2\cdot5\cdot19\cdot23$	$2\cdot3\cdot5\cdot293$	$2^3\cdot5\cdot13\cdot17$	$2\cdot5\cdot7\cdot127$	$2^2\cdot3\cdot5\cdot149$	$2\cdot5\cdot29\cdot31$
41	91	....	$59\cdot149$	$3\cdot7\cdot421$	$17\cdot523$	....	$3^5\cdot37$
42	92	$2\cdot3\cdot31\cdot47$	$2^3\cdot7\cdot151$	$2\cdot4421$	$2^2\cdot3^2\cdot13\cdot19$	$2\cdot17\cdot263$	$2^5\cdot281$
43	93	$7\cdot1249$	$3^2\cdot977$	$37\cdot239$	....	$3\cdot11\cdot271$	$17\cdot23^2$
44	94	$2^3\cdot1093$	$2\cdot4397$	$2^3\cdot3\cdot11\cdot67$	$2\cdot4447$	$2^4\cdot13\cdot43$	$2\cdot3\cdot1499$
45	95	$3\cdot5\cdot11\cdot53$	$5\cdot1759$	$5\cdot29\cdot61$	$3\cdot5\cdot593$	$5\cdot1789$	$5\cdot7\cdot257$
46	96	$2\cdot4373$	$2^2\cdot3\cdot733$	$2\cdot4423$	$2^6\cdot139$	$2\cdot3^2\cdot7\cdot71$	$2^2\cdot13\cdot173$
47	97	....	$19\cdot463$	$3^2\cdot983$	$7\cdot31\cdot41$	$23\cdot389$	$3\cdot2999$
48	98	$2^2\cdot3^7$	$2\cdot53\cdot83$	$2^4\cdot7\cdot79$	$2\cdot3\cdot1483$	$2^2\cdot2237$	$2\cdot11\cdot409$
49	99	$13\cdot673$	$3\cdot7\cdot419$	....	$11\cdot809$	$3\cdot19\cdot157$	....
50	100	$2\cdot5^4\cdot7$	$2^5\cdot5^2\cdot11$	$2\cdot3\cdot5^2\cdot59$	$2^2\cdot5^2\cdot89$	$2\cdot5^2\cdot179$	$2^3\cdot3^2\cdot5^3$

From	To	9000 9050	9050 9100	9100 9150	9150 9200	9200 9250	9250 9300
0	50	$2^3\cdot3^2\cdot5^3$	$2\cdot5^2\cdot181$	$2^2\cdot5^2\cdot7\cdot13$	$2\cdot3\cdot5^2\cdot61$	$2^4\cdot5^2\cdot23$	$2\cdot5^3\cdot37$
1	51	....	3·7·431	19·479	....	3·3067	$11\cdot29^2$
2	52	2·7·643	$2^2\cdot31\cdot73$	2·3·37·41	$2^6\cdot11\cdot13$	2·43·107	$2^2\cdot3^2\cdot257$
3	53	3·3001	11·823	....	$3^4\cdot113$	....	19·487
4	54	$2^2\cdot2251$	$2\cdot3^2\cdot503$	$2^4\cdot569$	2·23·199	$2^2\cdot3\cdot13\cdot59$	2·7·661
5	55	5·1801	5·1811	3·5·607	5·1831	5·7·263	3·5·617
6	56	2·3·19·79	$2^5\cdot283$	2·29·157	$2^2\cdot3\cdot7\cdot109$	2·4603	$2^3\cdot13\cdot89$
7	57	....	3·3019	7·1301	....	$3^3\cdot11\cdot31$	....
8	58	$2^4\cdot563$	2·7·647	$2^2\cdot3^2\cdot11\cdot23$	2·19·241	$2^3\cdot1151$	2·3·1543
9	59	$3^2\cdot7\cdot11\cdot13$	....	....	3·43·71	....	47·197
10	60	2·5·17·53	$2^2\cdot3\cdot5\cdot151$	2·5·911	$2^3\cdot5\cdot229$	2·3·5·307	$2^2\cdot5\cdot463$
11	61	....	13·17·41	3·3037	....	61·151	$3^3\cdot7^3$
12	62	$2^2\cdot3\cdot751$	2·23·197	$2^3\cdot17\cdot67$	$2\cdot3^2\cdot509$	$2^2\cdot7^2\cdot47$	2·11·421
13	63	....	$3^2\cdot19\cdot53$	13·701	$7^2\cdot11\cdot17$	3·37·83	59·157
14	64	2·4507	$2^3\cdot11\cdot103$	$2\cdot3\cdot7^2\cdot31$	$2^2\cdot29\cdot79$	2·17·271	$2^4\cdot3\cdot193$
15	65	3·5·601	$5\cdot7^2\cdot37$	5·1823	3·5·13·47	5·19·97	5·17·109
16	66	$2^3\cdot7^2\cdot23$	2·3·1511	$2^2\cdot43\cdot53$	2·4583	$2^{10}\cdot3^2$	2·41·113
17	67	71·127	....	$3^2\cdot1013$	89·103	13·709	3·3089
18	68	$2\cdot3^3\cdot167$	$2^2\cdot2267$	2·47·97	$2^4\cdot3\cdot191$	2·11·419	$2^2\cdot7\cdot331$
19	69	29·311	3·3023	11·829	53·173	3·7·439	13·23·31
20	70	$2^2\cdot5\cdot11\cdot41$	2·5·907	$2^5\cdot3\cdot5\cdot19$	2·5·7·131	$2^2\cdot5\cdot461$	$2\cdot3^2\cdot5\cdot103$
21	71	3·31·97	47·193	7·1303	$3^2\cdot1019$	....	73·127
22	72	2·13·347	$2^4\cdot3^4\cdot7$	2·4561	$2^2\cdot2293$	2·3·29·53	$2^3\cdot19\cdot61$
23	73	7·1289	43·211	3·3041	....	23·401	3·11·281
24	74	$2^6\cdot3\cdot47$	2·13·349	$2^2\cdot2281$	2·3·11·139	$2^3\cdot11\cdot53$	2·4637
25	75	$5^2\cdot19^2$	$3\cdot5^2\cdot11^2$	$5^3\cdot73$	$5^2\cdot367$	$3^2\cdot5^2\cdot41$	$5^2\cdot7\cdot53$
26	76	2·4513	$2^2\cdot2269$	$2\cdot3^3\cdot13^2$	$2^3\cdot31\cdot37$	2·7·659	$2^2\cdot3\cdot773$
27	77	$3^2\cdot17\cdot59$	29·313	....	3·7·19·23	....	....
28	78	$2^2\cdot37\cdot61$	2·3·17·89	$2^3\cdot7\cdot163$	2·13·353	$2^2\cdot3\cdot769$	2·4639
29	79	....	7·1297	3·17·179	67·137	11·839	$3^2\cdot1031$
30	80	2·3·5·7·43	$2^3\cdot5\cdot227$	2·5·11·83	$2^2\cdot3^3\cdot5\cdot17$	2·5·13·71	$2^6\cdot5\cdot29$
31	81	11·821	$3^2\cdot1009$	23·397	....	3·17·181	....
32	82	$2^3\cdot1129$	2·19·239	$2^2\cdot3\cdot761$	2·4591	$2^4\cdot577$	2·3·7·13·17
33	83	3·3011	31·293	....	3·3061	7·1319	....
34	84	2·4517	$2^2\cdot3\cdot757$	2·4567	$2^5\cdot7\cdot41$	$2\cdot3^5\cdot19$	$2^2\cdot11\cdot211$
35	85	5·13·139	5·23·79	$3^2\cdot5\cdot7\cdot29$	5·11·167	5·1847	3·5·619
36	86	$2^2\cdot3^2\cdot251$	2·7·11·59	$2^4\cdot571$	2·3·1531	$2^2\cdot2309$	2·4643
37	87	7·1291	3·13·233	....	....	3·3079	37·251
38	88	2·4519	$2^7\cdot71$	2·3·1523	$2^2\cdot2297$	2·31·149	$2^3\cdot3^3\cdot43$
39	89	3·23·131	61·149	13·19·37	$3^2\cdot1021$	....	7·1327
40	90	$2^4\cdot5\cdot113$	$2\cdot3^2\cdot5\cdot101$	$2^2\cdot5\cdot457$	2·5·919	$2^3\cdot3\cdot5\cdot7\cdot11$	2·5·929
41	91	....	....	3·11·277	7·13·101	....	3·19·163
42	92	2·3·11·137	$2^2\cdot2273$	2·7·653	$2^3\cdot3\cdot383$	2·4621	$2^2\cdot23\cdot101$
43	93	....	3·7·433	41·223	29·317	$3^2\cdot13\cdot79$	....
44	94	$2^2\cdot7\cdot17\cdot19$	2·4547	$2^3\cdot3^2\cdot127$	2·4597	$2^2\cdot2311$	2·3·1549
45	95	$3^3\cdot5\cdot67$	5·17·107	5·31·59	3·5·613	$5\cdot43^2$	$5\cdot11\cdot13^2$
46	96	2·4523	$2^3\cdot3\cdot379$	2·17·269	$2^2\cdot11^2\cdot19$	2·3·23·67	$2^4\cdot7\cdot83$
47	97	83·109	11·827	3·3049	17·541	7·1321	$3^2\cdot1033$
48	98	$2^3\cdot3\cdot13\cdot29$	2·4549	$2^2\cdot2287$	$2\cdot3^2\cdot7\cdot73$	$2^5\cdot17^2$	2·4649
49	99	....	$3^3\cdot337$	7·1307	....	3·3083	17·547
50	100	$2\cdot5^2\cdot181$	$2^2\cdot5^2\cdot7\cdot13$	$2\cdot3\cdot5^2\cdot61$	$2^4\cdot5^2\cdot23$	$2\cdot5^3\cdot37$	$2^2\cdot3\cdot5^2\cdot31$

From		9300	9350	9400	9450	9500	9550
To		9350	9400	9450	9500	9550	9600
0	50	$2^2 \cdot 3 \cdot 5^2 \cdot 31$	$2 \cdot 5^2 \cdot 11 \cdot 17$	$2^3 \cdot 5^2 \cdot 47$	$2 \cdot 3^3 \cdot 5^2 \cdot 7$	$2^2 \cdot 5^3 \cdot 19$	$2 \cdot 5^2 \cdot 191$
1	51	71·131	$3^2 \cdot 1039$	7·17·79	13·727	3·3167	....
2	52	2·4651	$2^3 \cdot 7 \cdot 167$	2·3·1567	$2^2 \cdot 17 \cdot 139$	2·4751	$2^4 \cdot 3 \cdot 199$
3	53	3·7·443	47·199	....	3·23·137	13·17·43	41·233
4	54	$2^3 \cdot 1163$	2·3·1559	$2^2 \cdot 2351$	2·29·163	$2^5 \cdot 3^3 \cdot 11$	2·17·281
5	55	5·1861	5·1871	$3^2 \cdot 5 \cdot 11 \cdot 19$	5·31·61	5·1901	$3 \cdot 5 \cdot 7^2 \cdot 13$
6	56	$2 \cdot 3^2 \cdot 11 \cdot 47$	$2^2 \cdot 2339$	2·4703	$2^4 \cdot 3 \cdot 197$	$2 \cdot 7^2 \cdot 97$	$2^2 \cdot 2389$
7	57	41·227	3·3119	23·409	$7^2 \cdot 193$	3·3169	19·503
8	58	$2^2 \cdot 13 \cdot 179$	2·4679	$2^6 \cdot 3 \cdot 7^2$	2·4729	$2^2 \cdot 2377$	$2 \cdot 3^4 \cdot 59$
9	59	3·29·107	$7^2 \cdot 191$	97^2	$3^2 \cdot 1051$	37·257	$11^2 \cdot 79$
10	60	$2 \cdot 5 \cdot 7^2 \cdot 19$	$2^4 \cdot 3^2 \cdot 5 \cdot 13$	2·5·941	$2^2 \cdot 5 \cdot 11 \cdot 43$	2·3·5·317	$2^3 \cdot 5 \cdot 239$
11	61	....	11·23·37	3·3137	....	....	3·3187
12	62	$2^5 \cdot 3 \cdot 97$	2·31·151	$2^2 \cdot 13 \cdot 181$	2·3·19·83	$2^3 \cdot 29 \cdot 41$	2·7·683
13	63	67·139	3·3121	....	....	$3^2 \cdot 7 \cdot 151$	73·131
14	64	2·4657	$2^2 \cdot 2341$	$2 \cdot 3^2 \cdot 523$	$2^3 \cdot 7 \cdot 13^2$	2·67·71	$2^2 \cdot 3 \cdot 797$
15	65	$3^4 \cdot 5 \cdot 23$	5·1873	5·7·269	3·5·631	5·11·173	5·1913
16	66	$2^2 \cdot 17 \cdot 137$	2·3·7·223	$2^3 \cdot 11 \cdot 107$	2·4733	$2^2 \cdot 3 \cdot 13 \cdot 61$	2·4783
17	67	$7 \cdot 11^3$	17·19·29	3·43·73	....	31·307	$3^2 \cdot 1063$
18	68	2·3·1553	$2^3 \cdot 1171$	2·17·277	$2^2 \cdot 3^2 \cdot 263$	2·4759	$2^5 \cdot 13 \cdot 23$
19	69	....	$3^3 \cdot 347$	....	17·557	3·19·167	7·1367
20	70	$2^3 \cdot 5 \cdot 233$	2·5·937	$2^2 \cdot 3 \cdot 5 \cdot 157$	2·5·947	$2^4 \cdot 5 \cdot 7 \cdot 17$	2·3·5·11·29
21	71	3·13·239	....	....	3·7·11·41	....	17·563
22	72	2·59·79	$2^2 \cdot 3 \cdot 11 \cdot 71$	2·7·673	$2^8 \cdot 37$	$2 \cdot 3^2 \cdot 23^2$	$2^2 \cdot 2393$
23	73	....	7·13·103	$3^3 \cdot 349$	....	89·107	3·3191
24	74	$2^2 \cdot 3^2 \cdot 7 \cdot 37$	2·43·109	$2^4 \cdot 19 \cdot 31$	2·3·1579	$2^2 \cdot 2381$	2·4787
25	75	$5^2 \cdot 373$	$3 \cdot 5^5$	$5^2 \cdot 13 \cdot 29$	$5^2 \cdot 379$	$3 \cdot 5^2 \cdot 127$	$5^2 \cdot 383$
26	76	2·4663	$2^5 \cdot 293$	2·3·1571	$2^2 \cdot 23 \cdot 103$	2·11·433	$2^3 \cdot 3^2 \cdot 7 \cdot 19$
27	77	3·3109	....	11·857	$3^6 \cdot 13$	7·1361	61·157
28	78	$2^4 \cdot 11 \cdot 53$	$2 \cdot 3^2 \cdot 521$	$2^2 \cdot 2357$	2·7·677	$2^3 \cdot 3 \cdot 397$	2·4789
29	79	19·491	83·113	3·7·449	....	13·733	3·31·103
30	80	2·3·5·311	$2^2 \cdot 5 \cdot 7 \cdot 67$	2·5·23·41	$2^3 \cdot 3 \cdot 5 \cdot 79$	2·5·953	$2^2 \cdot 5 \cdot 479$
31	81	7·31·43	3·53·59	....	19·499	$3^3 \cdot 353$	11·13·67
32	82	$2^2 \cdot 2333$	2·4691	$2^3 \cdot 3^2 \cdot 131$	2·11·431	$2^2 \cdot 2383$	2·3·1597
33	83	$3^2 \cdot 17 \cdot 61$	11·853	....	3·29·109	....	$7 \cdot 37^2$
34	84	2·13·359	$2^3 \cdot 3 \cdot 17 \cdot 23$	2·53·89	$2^2 \cdot 2371$	2·3·7·227	$2^4 \cdot 599$
35	85	5·1867	5·1877	3·5·17·37	5·7·271	5·1907	$3^3 \cdot 5 \cdot 71$
36	86	$2^3 \cdot 3 \cdot 389$	$2 \cdot 13 \cdot 19^2$	$2^2 \cdot 7 \cdot 337$	$2 \cdot 3^2 \cdot 17 \cdot 31$	$2^6 \cdot 149$	2·4793
37	87	....	$3^2 \cdot 7 \cdot 149$	....	53·179	$3 \cdot 11 \cdot 17^2$	....
38	88	2·7·23·29	$2^2 \cdot 2347$	$2 \cdot 3 \cdot 11^2 \cdot 13$	$2^4 \cdot 593$	2·19·251	$2^2 \cdot 3 \cdot 17 \cdot 47$
39	89	3·11·283	41·229	....	3·3163	....	43·223
40	90	$2^2 \cdot 5 \cdot 467$	2·3·5·313	$2^5 \cdot 5 \cdot 59$	2·5·13·73	$2^2 \cdot 3^2 \cdot 5 \cdot 53$	2·5·7·137
41	91	....	....	$3^2 \cdot 1049$	....	7·29·47	3·23·139
42	92	$2 \cdot 3^3 \cdot 173$	$2^4 \cdot 587$	2·4721	$2^2 \cdot 3 \cdot 7 \cdot 113$	2·13·369	$2^3 \cdot 11 \cdot 109$
43	93	....	3·31·101	7·19·71	11·863	3·31·81	53·181
44	94	$2^7 \cdot 73$	2·7·11·61	$2^2 \cdot 3 \cdot 787$	2·47·101	$2^3 \cdot 1193$	$2 \cdot 3^2 \cdot 13 \cdot 41$
45	95	3·5·7·89	5·1879	5·1889	$3^2 \cdot 5 \cdot 211$	5·23·83	5·19·101
46	96	2·4673	$2^2 \cdot 3^4 \cdot 29$	2·4723	$2^3 \cdot 1187$	2·3·37·43	$2^2 \cdot 2399$
47	97	13·719	....	3·47·67	....	....	3·7·457
48	98	$2^2 \cdot 3 \cdot 19 \cdot 41$	2·37·127	$2^3 \cdot 1181$	2·3·1583	$2^2 \cdot 7 \cdot 11 \cdot 31$	2·4799
49	99	....	3·13·241	11·859	7·23·59	$3^2 \cdot 1061$	29·331
50	100	$2 \cdot 5^2 \cdot 11 \cdot 17$	$2^3 \cdot 5^2 \cdot 47$	$2 \cdot 3^3 \cdot 5^2 \cdot 7$	$2^2 \cdot 5^3 \cdot 19$	$2 \cdot 5^2 \cdot 191$	$2^7 \cdot 3 \cdot 5^2$

From	To	9600 9650	9650 9700	9700 9750	9750 9800	9800 9850	9850 9900
0	50	$2^7\cdot3\cdot5^2$	$2\cdot5^2\cdot193$	$2^2\cdot5^2\cdot97$	$2\cdot3\cdot5^3\cdot13$	$2^3\cdot5^2\cdot7^2$	$2\cdot5^2\cdot197$
1	51	....	3·3217	89·109	$7^2\cdot199$	$3^4\cdot11^2$	....
2	52	2·4801	$2^2\cdot19\cdot127$	$2\cdot3^2\cdot7^2\cdot11$	$2^3\cdot23\cdot53$	$2\cdot13^2\cdot29$	$2^2\cdot3\cdot821$
3	53	$3^2\cdot11\cdot97$	$7^2\cdot197$	31·313	3·3251	....	59·167
4	54	$2^2\cdot7^4$	2·3·1609	$2^3\cdot1213$	2·4877	$2^2\cdot3\cdot19\cdot43$	2·13·379
5	55	5·17·113	5·1931	3·5·647	5·1951	5·37·53	$3^3\cdot5\cdot73$
6	56	2·3·1601	$2^3\cdot17\cdot71$	2·23·211	$2^2\cdot3^2\cdot271$	2·4903	$2^7\cdot7\cdot11$
7	57	13·739	$3^2\cdot29\cdot37$	17·571	11·887	3·7·467	....
8	58	$2^3\cdot1201$	2·11·439	$2^2\cdot3\cdot809$	2·7·17·41	$2^4\cdot613$	2·3·31·53
9	59	3·3203	13·743	7·19·73	3·3253	17·577	....
10	60	$2\cdot5\cdot31^2$	$2^2\cdot3\cdot5\cdot7\cdot23$	2·5·971	$2^5\cdot5\cdot61$	$2\cdot3^3\cdot5\cdot109$	$2^2\cdot5\cdot17\cdot29$
11	61	7·1373	....	$3^2\cdot13\cdot83$	43·227	....	3·19·173
12	62	$2^2\cdot3^3\cdot89$	2·4831	$2^4\cdot607$	2·3·1627	$2^2\cdot11\cdot223$	2·4931
13	63	....	3·3221	11·883	13·751	3·3271	7·1409
14	64	2·11·19·23	$2^6\cdot151$	2·3·1619	$2^2\cdot2441$	2·7·701	$2^3\cdot3^2\cdot137$
15	65	3·5·641	5·1933	5·29·67	$3^2\cdot5\cdot7\cdot31$	5·13·151	5·1973
16	66	$2^4\cdot601$	$2\cdot3^3\cdot179$	$2^2\cdot7\cdot347$	2·19·257	$2^3\cdot3\cdot409$	2·4933
17	67	59·163	7·1381	3·41·79	....	....	3·11·13·23
18	68	2·3·7·229	$2^2\cdot2417$	2·43·113	$2^3\cdot3\cdot11\cdot37$	2·4909	$2^2\cdot2467$
19	69	....	3·11·293	....	....	$3^2\cdot1091$	71·139
20	70	$2^2\cdot5\cdot13\cdot37$	2·5·967	$2^3\cdot3^5\cdot5$	2·5·977	$2^2\cdot5\cdot491$	2·3·5·7·47
21	71	$3^2\cdot1069$	19·509	....	3·3257	7·23·61	....
22	72	2·17·283	$2^3\cdot3\cdot13\cdot31$	2·4861	$2^2\cdot7\cdot349$	2·3·1637	$2^4\cdot617$
23	73	....	17·569	3·7·463	29·337	11·19·47	$3^2\cdot1097$
24	74	$2^3\cdot3\cdot401$	2·7·691	$2^2\cdot11\cdot13\cdot17$	$2\cdot3^3\cdot181$	$2^5\cdot307$	2·4937
25	75	$5^3\cdot7\cdot11$	$3^2\cdot5^2\cdot43$	$5^2\cdot389$	$5^2\cdot17\cdot23$	$3\cdot5^2\cdot131$	$5^3\cdot79$
26	76	2·4813	$2^2\cdot41\cdot59$	2·3·1621	$2^4\cdot13\cdot47$	$2\cdot17^3$	$2^2\cdot3\cdot823$
27	77	3·3209	....	71·137	3·3259	31·317	7·17·83
28	78	$2^2\cdot29\cdot83$	2·3·1613	$2^9\cdot19$	2·4889	$2^2\cdot3^3\cdot7\cdot13$	2·11·449
29	79	....	....	$3^2\cdot23\cdot47$	7·11·127	....	3·37·89
30	80	$2\cdot3^2\cdot5\cdot107$	$2^4\cdot5\cdot11^2$	2·5·7·139	$2^2\cdot3\cdot5\cdot163$	2·5·983	$2^3\cdot5\cdot13\cdot19$
31	81	....	3·7·461	37·263	....	3·29·113	41·241
32	82	$2^5\cdot7\cdot43$	2·47·103	$2^2\cdot3\cdot811$	2·67·73	$2^3\cdot1229$	$2\cdot3^4\cdot61$
33	83	$3\cdot13^2\cdot19$	23·421	....	$3^2\cdot1087$	....	....
34	84	2·4817	$2^2\cdot3^2\cdot269$	2·31·157	$2^3\cdot1223$	2·3·11·149	$2^2\cdot7\cdot353$
35	85	5·41·47	5·13·149	3·5·11·59	5·19·103	5·7·281	3·5·659
36	86	$2^2\cdot3\cdot11\cdot73$	2·29·167	$2^3\cdot1217$	2·3·7·233	$2^2\cdot2459$	2·4943
37	87	23·419	3·3229	7·13·107	....	$3^2\cdot1093$	....
38	88	2·61·79	$2^3\cdot7\cdot173$	$2\cdot3^2\cdot541$	$2^2\cdot1247$	2·4919	$2^5\cdot3\cdot103$
39	89	$3^4\cdot7\cdot17$	....	....	3·13·251	....	11·29·31
40	90	$2^3\cdot5\cdot241$	2·3·5·17·19	$2^2\cdot5\cdot487$	2·5·11·89	$2^4\cdot3\cdot5\cdot41$	2·5·23·43
41	91	31·311	11·881	3·17·191	....	13·757	$3^2\cdot7\cdot157$
42	92	2·3·1607	$2^2\cdot2423$	2·4871	$2^6\cdot3^2\cdot17$	2·7·19·37	$2^2\cdot2473$
43	93	....	$3^3\cdot359$	....	7·1399	3·17·193	13·761
44	94	$2^2\cdot2411$	2·37·131	$2^4\cdot3\cdot7\cdot29$	2·59·83	$2^2\cdot23\cdot107$	2·3·17·97
45	95	3·5·643	5·7·277	5·1949	3·5·653	5·11·179	5·1979
46	96	2·7·13·53	$2^4\cdot3\cdot101$	2·11·443	$2^2\cdot31\cdot79$	$2\cdot3^2\cdot547$	$2^3\cdot1237$
47	97	11·877	....	$3^3\cdot19^2$	97·101	43·229	3·3299
48	98	$2^4\cdot3^2\cdot67$	2·13·373	$2^2\cdot2437$	2·3·23·71	$2^3\cdot1231$	$2\cdot7^2\cdot101$
49	99	....	3·53·61	....	41·239	$3\cdot7^2\cdot67$	19·521
50	100	$2\cdot5^2\cdot193$	$2^2\cdot5^2\cdot97$	$2\cdot3\cdot5^3\cdot13$	$2^3\cdot5^2\cdot7^2$	$2\cdot5^2\cdot197$	$2^2\cdot3^2\cdot5^2\cdot11$

From	To	9900 to 9950	9950 to 10000	10000 to 10050	10050 to 10100	10100 to 10150	10150 to 10200
0	50	$2^2\cdot3^2\cdot5^2\cdot11$	$2\cdot5^2\cdot199$	$2^4\cdot5^4$	$2\cdot3\cdot5^2\cdot67$	$2^2\cdot5^2\cdot101$	$2\cdot5^2\cdot7\cdot29$
1	51	....	$3\cdot31\cdot107$	$73\cdot137$	$19\cdot23^2$	$3\cdot7\cdot13\cdot37$	....
2	52	$2\cdot4951$	$2^5\cdot311$	$2\cdot3\cdot1667$	$2^2\cdot7\cdot359$	$2\cdot5051$	$2^3\cdot3^3\cdot47$
3	53	$3\cdot3301$	$37\cdot269$	$7\cdot1429$	$3^2\cdot1117$	....	$11\cdot13\cdot71$
4	54	$2^4\cdot619$	$2\cdot3^2\cdot7\cdot79$	$2^2\cdot41\cdot61$	$2\cdot11\cdot457$	$2^3\cdot3\cdot421$	$2\cdot5077$
5	55	$5\cdot7\cdot283$	$5\cdot11\cdot181$	$3\cdot5\cdot23\cdot29$	$5\cdot2011$	$5\cdot43\cdot47$	$3\cdot5\cdot677$
6	56	$2\cdot3\cdot13\cdot127$	$2^2\cdot19\cdot131$	$2\cdot5003$	$2^3\cdot3\cdot419$	$2\cdot31\cdot163$	$2^2\cdot2539$
7	57	....	$3\cdot3319$	....	$89\cdot113$	$3^2\cdot1123$	$7\cdot1451$
8	58	$2^2\cdot2477$	$2\cdot13\cdot383$	$2^3\cdot3^2\cdot139$	$2\cdot47\cdot107$	$2^2\cdot7\cdot19^2$	$2\cdot3\cdot1693$
9	59	$3^3\cdot367$	$23\cdot433$	....	$3\cdot7\cdot479$	$11\cdot919$	....
10	60	$2\cdot5\cdot991$	$2^3\cdot3\cdot5\cdot83$	$2\cdot5\cdot7\cdot11\cdot13$	$2^2\cdot5\cdot503$	$2\cdot3\cdot5\cdot337$	$2^4\cdot5\cdot127$
11	61	$11\cdot17\cdot53$	$7\cdot1423$	$3\cdot47\cdot71$	....	....	$3^2\cdot1129$
12	62	$2^3\cdot3\cdot7\cdot59$	$2\cdot17\cdot293$	$2^2\cdot2503$	$2\cdot3^2\cdot13\cdot43$	$2^7\cdot79$	$2\cdot5081$
13	63	$23\cdot431$	$3^5\cdot41$	$17\cdot19\cdot31$	$29\cdot347$	$3\cdot3371$	....
14	64	$2\cdot4957$	$2^2\cdot47\cdot53$	$2\cdot3\cdot1669$	$2^4\cdot17\cdot37$	$2\cdot13\cdot389$	$2^2\cdot3\cdot7\cdot11^2$
15	65	$3\cdot5\cdot661$	$5\cdot1993$	$5\cdot2003$	$3\cdot5\cdot11\cdot61$	$5\cdot7\cdot17^2$	$5\cdot19\cdot107$
16	66	$2^2\cdot37\cdot67$	$2\cdot3\cdot11\cdot151$	$2^5\cdot313$	$2\cdot7\cdot719$	$2^2\cdot3^2\cdot281$	$2\cdot13\cdot17\cdot23$
17	67	$47\cdot211$	....	$3^3\cdot7\cdot53$	....	$67\cdot151$	$3\cdot3389$
18	68	$2\cdot3^2\cdot19\cdot29$	$2^4\cdot7\cdot89$	$2\cdot5009$	$2^2\cdot3\cdot839$	$2\cdot5059$	$2^3\cdot31\cdot41$
19	69	$7\cdot13\cdot109$	$3\cdot3323$	$43\cdot233$	....	$3\cdot3373$	....
20	70	$2^6\cdot5\cdot31$	$2\cdot5\cdot997$	$2^2\cdot3\cdot5\cdot167$	$2\cdot5\cdot19\cdot53$	$2^3\cdot5\cdot11\cdot23$	$2\cdot3^2\cdot5\cdot113$
21	71	$3\cdot3307$	$13^2\cdot59$	$11\cdot911$	$3^3\cdot373$	$29\cdot349$	$7\cdot1453$
22	72	$2\cdot11^2\cdot41$	$2^2\cdot3^2\cdot277$	$2\cdot5011$	$2^3\cdot1259$	$2\cdot3\cdot7\cdot241$	$2^2\cdot2543$
23	73	....	....	$3\cdot13\cdot257$	$7\cdot1439$	$53\cdot191$	$3\cdot3391$
24	74	$2^2\cdot3\cdot827$	$2\cdot4987$	$2^3\cdot7\cdot179$	$2\cdot3\cdot23\cdot73$	$2^2\cdot2531$	$2\cdot5087$
25	75	$5^2\cdot397$	$3\cdot5^2\cdot7\cdot19$	$5^2\cdot401$	$5^2\cdot13\cdot31$	$3^4\cdot5^3$	$5^2\cdot11\cdot37$
26	76	$2\cdot7\cdot709$	$2^3\cdot29\cdot43$	$2\cdot3^2\cdot557$	$2^2\cdot11\cdot229$	$2\cdot61\cdot83$	$2^6\cdot3\cdot53$
27	77	$3^2\cdot1103$	$11\cdot907$	$37\cdot271$	$3\cdot3359$	$13\cdot19\cdot41$	....
28	78	$2^3\cdot17\cdot73$	$2\cdot3\cdot1663$	$2^2\cdot23\cdot109$	$2\cdot5039$	$2^4\cdot3\cdot211$	$2\cdot7\cdot727$
29	79	....	$17\cdot587$	$3\cdot3343$	....	$7\cdot1447$	$3^3\cdot13\cdot29$
30	80	$2\cdot3\cdot5\cdot331$	$2^2\cdot5\cdot499$	$2\cdot5\cdot17\cdot59$	$2^5\cdot3^2\cdot5\cdot7$	$2\cdot5\cdot1013$	$2^2\cdot5\cdot509$
31	81	....	$3^2\cdot1109$	$7\cdot1433$	$17\cdot593$	$3\cdot11\cdot307$	....
32	82	$2^2\cdot13\cdot191$	$2\cdot7\cdot23\cdot31$	$2^4\cdot3\cdot11\cdot19$	$2\cdot71^2$	$2^2\cdot17\cdot149$	$2\cdot3\cdot1697$
33	83	$3\cdot7\cdot11\cdot43$	$67\cdot149$	$79\cdot127$	$3\cdot3361$	....	$17\cdot599$
34	84	$2\cdot4967$	$2^8\cdot3\cdot13$	$2\cdot29\cdot173$	$2^2\cdot2521$	$2\cdot3^3\cdot563$	$2^3\cdot19\cdot67$
35	85	$5\cdot1987$	$5\cdot1997$	$3^2\cdot5\cdot223$	$5\cdot2017$	$5\cdot2027$	$3\cdot5\cdot7\cdot97$
36	86	$2^4\cdot3^3\cdot23$	$2\cdot4993$	$2^2\cdot13\cdot193$	$2\cdot3\cdot41^2$	$2^3\cdot7\cdot181$	$2\cdot11\cdot463$
37	87	$19\cdot523$	$3\cdot3329$	....	$7\cdot11\cdot131$	$3\cdot31\cdot109$	$61\cdot167$
38	88	$2\cdot4969$	$2^2\cdot11\cdot227$	$2\cdot3\cdot7\cdot239$	$2^3\cdot13\cdot97$	$2\cdot37\cdot137$	$2^2\cdot3^2\cdot283$
39	89	$3\cdot3313$	$7\cdot1427$	....	$3^2\cdot19\cdot59$	....	$23\cdot443$
40	90	$2^2\cdot5\cdot7\cdot71$	$2\cdot3^3\cdot5\cdot37$	$2^3\cdot5\cdot251$	$2\cdot5\cdot1009$	$2^2\cdot3\cdot5\cdot13^2$	$2\cdot5\cdot1019$
41	91	....	$97\cdot103$	$3\cdot3347$	....	....	$3\cdot43\cdot79$
42	92	$2\cdot3\cdot1657$	$2^3\cdot1249$	$2\cdot5021$	$2^2\cdot3\cdot29^2$	$2\cdot11\cdot461$	$2^4\cdot7^2\cdot13$
43	93	$61\cdot163$	$3\cdot3331$	$11^2\cdot83$	....	$3^2\cdot7^2\cdot23$	....
44	94	$2^3\cdot11\cdot113$	$2\cdot19\cdot263$	$2^2\cdot3^4\cdot31$	$2\cdot7^2\cdot103$	$2^5\cdot317$	$2\cdot3\cdot1699$
45	95	$3^2\cdot5\cdot13\cdot17$	$5\cdot1999$	$5\cdot7^2\cdot41$	$3\cdot5\cdot673$	$5\cdot2029$	$5\cdot2039$
46	96	$2\cdot4973$	$2^2\cdot3\cdot7^2\cdot17$	$2\cdot5023$	$2^4\cdot631$	$2\cdot3\cdot19\cdot89$	$2^2\cdot2549$
47	97	$7^3\cdot29$	$13\cdot769$	$3\cdot17\cdot197$	$23\cdot439$	$73\cdot139$	$3^2\cdot11\cdot103$
48	98	$2^2\cdot3\cdot829$	$2\cdot4999$	$2^6\cdot157$	$2\cdot3^3\cdot11\cdot17$	$2^2\cdot43\cdot59$	$2\cdot5099$
49	99	....	$3^2\cdot11\cdot101$	$13\cdot773$	....	$3\cdot17\cdot199$	$7\cdot31\cdot47$
50	100	$2\cdot5^2\cdot199$	$2^4\cdot5^4$	$2\cdot3\cdot5^2\cdot67$	$2^2\cdot5^2\cdot101$	$2\cdot5^2\cdot7\cdot29$	$2^3\cdot3\cdot5^2\cdot17$

Decimal Equivalents

DECIMAL EQUIVALENTS OF PARTS OF AN INCH.

$\frac{1}{64}$	.01563	$\frac{21}{64}$	.32813	$\frac{45}{64}$	.70313
$\frac{1}{32}$	.03125	$\frac{11}{32}$	.34375	$\frac{23}{32}$	.71875
$\frac{3}{64}$	.04688	$\frac{23}{64}$	.35938	$\frac{47}{64}$	.73438
1-16	.0625	3-8	.375	3-4	.75
$\frac{5}{64}$	.07813	$\frac{25}{64}$	.39063	$\frac{49}{64}$	.76563
$\frac{3}{32}$	.09375	$\frac{13}{32}$	.40625	$\frac{25}{32}$	.78125
$\frac{7}{64}$	.10938	$\frac{27}{64}$	.42188	$\frac{51}{64}$	.79688
1-8	.125	7-16	.4375	13-16	.8125
$\frac{9}{64}$	.14063	$\frac{29}{64}$	.45313	$\frac{53}{64}$	82813
$\frac{5}{32}$	.15625	$\frac{15}{32}$	.46875	$\frac{27}{32}$	.84375
$\frac{11}{64}$	.17188	$\frac{31}{64}$	.48438	$\frac{55}{64}$	85938
3-16	.1875	1-2	.5	7-8	.875
$\frac{13}{64}$	.20313	$\frac{33}{64}$	.51563	$\frac{57}{64}$	.89063
$\frac{7}{32}$	.21875	$\frac{17}{32}$	.53125	$\frac{29}{32}$	.90625
$\frac{15}{64}$	.23438	$\frac{35}{64}$	.54688	$\frac{59}{64}$	.92188
1-4	.25	9-16	.5625	15-16	.9375
$\frac{17}{64}$	.26563	$\frac{37}{64}$	.57813	$\frac{61}{64}$	.95313
$\frac{9}{32}$	.28125	$\frac{19}{32}$	.59375	$\frac{31}{32}$	.96875
$\frac{19}{64}$	.29688	$\frac{39}{64}$	.60938	$\frac{63}{64}$	.98438
5-16	.3125	5-8	.625	1	1.00000
		$\frac{41}{64}$	.64063		
		$\frac{21}{32}$	.65625		
		$\frac{43}{64}$	.67188		
		11-16	.6875		

TABLE OF DECIMAL EQUIVALENTS OF MILLIMETRES AND FRACTIONS OF MILLIMETRES.

mm. Inches.	mm. Inches.	mm. Inches.	mm. Inches.
$\frac{1}{100}$ = .00039	$\frac{33}{100}$ = .01299	$\frac{64}{100}$ = .02520	$\frac{95}{100}$ = .03740
$\frac{2}{100}$ = .00079	$\frac{34}{100}$ = .01339	$\frac{65}{100}$ = .02559	$\frac{96}{100}$ = .03780
$\frac{3}{100}$ = .00118	$\frac{35}{100}$ = .01378	$\frac{66}{100}$ = .02598	$\frac{97}{100}$ = .03819
$\frac{4}{100}$ = .00157	$\frac{36}{100}$ = .01417	$\frac{67}{100}$ = .02638	$\frac{98}{100}$ = .03858
$\frac{5}{100}$ = .00197	$\frac{37}{100}$ = .01457	$\frac{68}{100}$ = .02677	$\frac{99}{100}$ = .03898
$\frac{6}{100}$ = .00236	$\frac{38}{100}$ = .01496	$\frac{69}{100}$ = .02717	1 = .03937
$\frac{7}{100}$ = .00276	$\frac{39}{100}$ = .01535	$\frac{70}{100}$ = .02756	2 = .07874
$\frac{8}{100}$ = .00315	$\frac{40}{100}$ = .01575	$\frac{71}{100}$ = .02795	3 = .11811
$\frac{9}{100}$ = .00354	$\frac{41}{100}$ = .01614	$\frac{72}{100}$ = .02835	4 = .15748
$\frac{10}{100}$ = .00394	$\frac{42}{100}$ = .01654	$\frac{73}{100}$ = .02874	5 = .19685
$\frac{11}{100}$ = .00433	$\frac{43}{100}$ = .01693	$\frac{74}{100}$ = .02913	6 = .23622
$\frac{12}{100}$ = .00472	$\frac{44}{100}$ = .01732	$\frac{75}{100}$ = .02953	7 = .27559
$\frac{13}{100}$ = .00512	$\frac{45}{100}$ = .01772	$\frac{76}{100}$ = .02992	8 = .31496
$\frac{14}{100}$ = .00551	$\frac{46}{100}$ = .01811	$\frac{77}{100}$ = .03032	9 = .35433
$\frac{15}{100}$ = .00591	$\frac{47}{100}$ = .01850	$\frac{78}{100}$ = .03071	10 = .39370
$\frac{16}{100}$ = .00630	$\frac{48}{100}$ = .01890	$\frac{79}{100}$ = .03110	11 = .43307
$\frac{17}{100}$ = .00669	$\frac{49}{100}$ = .01929	$\frac{80}{100}$ = .03150	12 = .47244
$\frac{18}{100}$ = .00709	$\frac{50}{100}$ = .01969	$\frac{81}{100}$ = .03189	13 = .51181
$\frac{19}{100}$ = .00748	$\frac{51}{100}$ = .02008	$\frac{82}{100}$ = .03228	14 = .55118
$\frac{20}{100}$ = .00787	$\frac{52}{100}$ = .02047	$\frac{83}{100}$ = .03268	15 = .59055
$\frac{21}{100}$ = .00827	$\frac{53}{100}$ = .02087	$\frac{84}{100}$ = .03307	16 = .62992
$\frac{22}{100}$ = .00866	$\frac{54}{100}$ = .02126	$\frac{85}{100}$ = .03346	17 = .66929
$\frac{23}{100}$ = .00906	$\frac{55}{100}$ = .02165	$\frac{86}{100}$ = .03386	18 = .70866
$\frac{24}{100}$ = .00945	$\frac{56}{100}$ = .02205	$\frac{87}{100}$ = .03425	19 = .74803
$\frac{25}{100}$ = .00984	$\frac{57}{100}$ = .02244	$\frac{88}{100}$ = .03465	20 = .78740
$\frac{26}{100}$ = .01024	$\frac{58}{100}$ = .02283	$\frac{89}{100}$ = .03504	21 = .82677
$\frac{27}{100}$ = .01063	$\frac{59}{100}$ = .02323	$\frac{90}{100}$ = .03543	22 = .86614
$\frac{28}{100}$ = .01102	$\frac{60}{100}$ = .02362	$\frac{91}{100}$ = .03583	23 = .90551
$\frac{29}{100}$ = .01142	$\frac{61}{100}$ = .02402	$\frac{92}{100}$ = .03622	24 = .94488
$\frac{30}{100}$ = .01181	$\frac{62}{100}$ = .02441	$\frac{93}{100}$ = .03661	25 = .98425
$\frac{31}{100}$ = .01220	$\frac{63}{100}$ = .02480	$\frac{94}{100}$ = .03701	26 = 1.02362
$\frac{32}{100}$ = .01260			